The Newspaper of Information Systems Management
June 17, 1996, Vol. 30, No. 25, 156 Pages, $6/Copy, $48/Year

COMPUTERWORLD

In disk-array

Defections, late product force IBM reliance on StorageTek

By Craig Stedman
and Michael Goldberg

A stunning decision by IBM to accept emergency mainframe disk assistance from rival Storage Technology Corp. caught many customers off guard last week.

But with IBM's market share dwindling and its next-generation storage architecture nearly two years behind schedule, users agreed that the computer giant had to do something to stem a continuing tide of defections.

Interviews last week with a dozen mainframe users indicated that the deal for IBM to take over the marketing of StorageTek's Iceberg and Kodiak arrays as of July 1 should strengthen IBM's hand, even though its transition from past market dominance to codependence is embarrassing.

"I still have a lot of respect for what IBM can do" in developing storage products, said Dale Perry, director of technology architectures at Bell Sygma, Inc., the Toronto-based information systems and outsourcing arm of Bell Canada, Inc. "They just haven't done it lately."

Three gets you one

IBM's Ramac disk array compared with StorageTek's products

	Ramac	[illegible]	[illegible]
Operating mode	RAID Level 5	RAID Level 6+	[illegible]
Base disk storage	11.35G bytes	45G bytes	[illegible]
Disk capacity	180G bytes	720G bytes	[illegible]
Maximum cache	2G bytes	4.6G bytes	4G bytes
Escon I/O channels	4 to 16*	4 to 16	4 to 16

*Through external 3990 Model 6 storage controller

Part of the problem is that IBM's Ramac arrays aren't up to the challenge, users said.

"Ramac doesn't measure up to more state-of-the-art products," said Joel Van Dyke, manager of hardware planning at Chrysler Corp. in Centerline, Mich. He said Chrysler stores about 9T bytes of data on Ramacs, but it switched allegiances this year and now

In disk-array, page 137

WHAT'S INSIDE

- The Internet wins a First Amendment victory as the courts strike down the online decency act. See story, page 4, by Gary H. Anthes.
- For the lowdown on the rollouts at this week's PC Expo, see page 24.
- Who needs a Wall Street broker when the Internet is becoming a virtual stock exchange? Andrew Klein (below), founder of WR Capital, aims to cut out the middleman. See story, page 125, by Melissa Bane.



NT 4.0 crash warning: Certify device drivers

By Laura DiDio

Microsoft Corp.'s Windows NT 4.0 Beta 2 release dramatically improves speed and performance over Windows NT 3.51 — especially for high-end graphics applications and printing functions.

But the potential "gotcha" in this release is that users risk workstation and server crashes if they install device drivers that aren't on Microsoft's hardware compatibility list, according to users, systems integra-

NT 4.0, page 131



NASA's J. Briscoe Stephens says the benefits of the release outweigh potential problems

SAP unlinks R/3 apps; integration takes hit

By Julia King
VIENNA

SAP AG has lost all religion.

The $1.8 billion client/server software giant is splitting its R/3 enterprise system — famous for its tight integration — into separate products.

Client/server

In another unprecedented move, SAP is extending development of new R/3 Internet applications beyond its proprietary ABAP/4 programming language. The company also announced a set of 25 Internet programs as part of R/3 Version 3.1.

All three moves will give users greater flexibility and will speed the R/3 implementation process, company officials said. SAP made the announcements last week at its European user conference here.

"Customers will not be forced to

SAP, page 16

Honey, I shrunk the revenue; IRS can't account for billions

By Gary H. Anthes
WASHINGTON

The Internal Revenue Service just flunked a government audit.

In fact, the General Accounting Office said IRS accounting systems are so flawed, auditors were unable to verify balances that total tens of billions of dollars and stretch back four years.

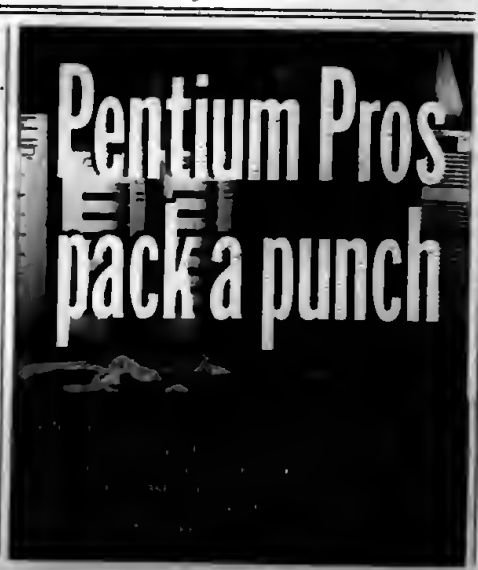
Other problems dug up by auditors included multibillion-dollar discrepancies, at least one $10 million write-off and outdated systems that are all but unauditable.

No contest

The IRS didn't dispute the GAO's findings, which were presented at a recent Senate hearing, and it offered no detailed explanation for them.

"It is disturbing to hear the IRS has not passed its financial audit," said Anthony Musick, the IRS' chief financial officer. "But that does not mean that the money the IRS is sup-

IRS, page 16



Newspaper

WHETHER YOU'RE BOUND FOR THE SKY...





With its exclusive FlexOpt™ dual bay modular design, the Micron™ Millennia TransPort™ lets you mix and match devices for a variety of customized choices. Drop in a modular CD ROM drive. Add a second intelligent modular lithium-ion battery or a second 1.2GB hard drive to boost productivity. And count on built-in flexibility like Micron's innovative Pick-a-Point™ system, offering touchpad or pointing-stick operation. Top it off with the industry's best warranty and you have the ideal portable computing solution.

STANDARD FEATURES

- 133MHz Pentium® processor
- Intel 430MX PCIset
- 256KB L2 pipelined burst cache
- 16MB EDO memory (48MB max.)
- 4X modular CD-ROM drive
- PCI graphics accelerator, 1MB EDO memory
- Pick-a-Point™ dual pointing devices integrate both pointing stick and touchpad
- Removable EIDE hard drive (1.2GB max.)
- 3.5" modular floppy drive
- Intelligent modular lithium-ion battery
- 16-bit stereo sound
- Built-in stereo speakers and microphone
- 2 Type II or one Type III PCMCIA slots
- S-Video and NTSC video-outputs
- Headphone, microphone and line-in jacks
- 2 infrared ports: one front, one back
- Parallel, serial, VGA and 2 PS/2 ports
- Dimensions: 11.7" x 9.4" x 2.0", Weight: 6.9 lbs.†
- Nylon carrying case
- Microsoft® Windows® 95 and MS Plus! CD
- Microsoft Office Pro 95 and Bookshelf 95 CDs
- Kensington™ Security Lock‡
- 5-year/3-year Micron Power℠ limited warranty*

† 6.9 lbs. includes 3.5" floppy and one battery.
‡ Lock secures both Millennia TransPort and Micron Dock.

The Millennia TransPort™

$4699

$5799

Designed for Microsoft® Windows®95

intel inside pentium

MICRON™ ELECTRONICS, INC.

800-554-5230

A PUBLICATION OF IDG

Inside Computerworld

June 17, 1996

News

NEWS

4 **Internet rules**
Information systems professionals cheer as a court strikes down the Communications Decency Act.

8 **What's missing from this picture?**
The World Wide Web isn't ready for prime time, corporate application developers find.

10 **OpenView forum**
As OpenView users meet next week, one hot topic will be how the software will continue to handle more tasks.

12 **Switching tools**
New packages help administrators track traffic through switched connections.

OPINION

36 **The customer is never wrong**
Maybe it is time for IS managers to redeploy their resources, Paul Gillin says.

37 **Multinational IS**
Are you sensitive to the IS and business needs of the foreign offices in your firm? Take columnist Michael Gentle's test and find out.

37 **The EDS spin-off**
The liberation of Electronic Data Systems from GM unleashes a powerful technology player, Susan Scrupski says.

132 **Desktop power**
Software isn't keeping up with Intel's four-way Pentium Pro boards, Charles Babcock says.

This week in COMPUTERWORLD

Surfer's paradise
Tech sites take you to the best of IS on the Web, and Hot spots link you to sites on the edge.

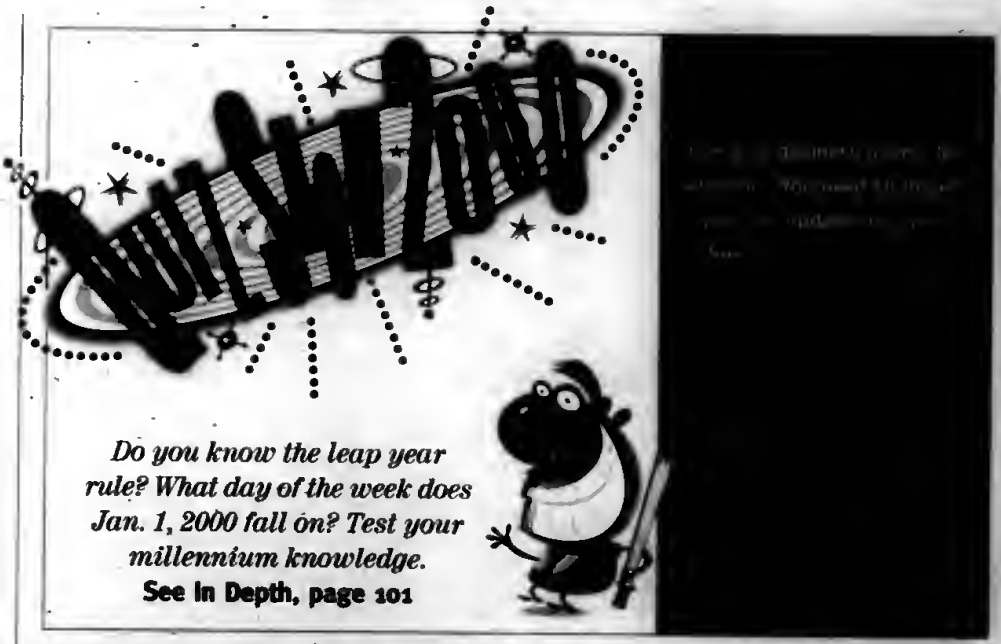
Communications Decency Act



Join Paul Gillin's thread on the impact of the CDA. Also, take our QuickPoll on the subject.

Bad rap?
Does management look down on IS? Consultant DuWayne Peterson leads this forum.

www.computerworld.com



Do you know the leap year rule? What day of the week does Jan. 1, 2000 fall on? Test your millennium knowledge.

See In Depth, page 101

Technical Sections

SERVERS & PCS

39 **Pentium Pro-based servers**
Windows NT-based application servers, powered by Intel's Pentium Pro chip, to hit the market.

39 **Storage management**
IBM extends automated data storage management support to Windows NT.

SOFTWARE

47 **OpenVMS meets NT**
A third wave of products again accelerates Digital's attempt to integrate Windows NT with OpenVMS environments.

50 **Review: Lotus Components**
With a standard way of embedding charts and other information in Notes documents, Lotus Components makes it much easier to share information.

THE ENTERPRISE NETWORK

65 **Coping with mergers**
Users see a light at the end of the acquisitions tunnel — better integrated products and more of them.

68 **Giving ATM the college try**
William Jewell College migrates to an ATM backbone.

THE INTERNET

73 **If you can't beat 'em . . .**
Online services' migration to the Internet is more complicated than it might appear.

76 **Intranet tools**
WebMate launches software to integrate corporate intranets with database technology.

CORPORATE STRATEGIES

82 **Keep on truckin'**
Freightliner uses case-based reasoning to give dealers across the country faster, easier ways to fix its trucks. Meanwhile, Mack Trucks chooses frame relay over SNA for more networking flexibility.



82 **Healthy consortium**
Health care players are hoping that a new standards-driven consortium will lead to greater interoperability.

Features

MANAGING

84 **Love IT, hate my IS organization**
An exclusive *Computerworld* survey of business executives shows their rampant frustration with their IS staffers.

86 **Surf sites**
World Wide Web pages for IS managers.

88 **IS Manager's Bookshelf**
Reviews of *Teams and Technology* and *The Loyalty Effect*.

BUYER'S GUIDE

93 **Hands-on testing of Pentium Pro servers**

IN DEPTH

101 **The year 2000 quiz**

CAREERS

105 **Cool career sites**
A new column on Web sites for career-minded IS professionals.

107 **Regional Scope: Chicago**
Job offers aplenty are blowing through the Windy City.

FINANCE & INVESTING

120 **The virtual exchange**
Will the Internet become the place to trade stocks?

Etc.

Company index	129
Editorial/Letters	36
How to contact CW	129
Inside Lines	132
Stock Ticker	127

OR BOUND TO YOUR DESK, MICRON™ HAS YOU COVERED.

System shown is Micron Millennia.



SERVICE & RELIABILITY • READERS' CHOICE • PC MAGAZINE

W

MILLENNIA™ PRO200

- Intel 200MHz Pentium® Pro processor
- 256KB internal cache, flash BIOS
- 8X EIDE CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- PCI 64-bit 3D video, MPEG, 2MB EDO
- *Tool-free* minitower or desktop
- Microsoft® Mouse, 104-key keyboard
- Microsoft Windows NT™ Workstation 3.51 CD or Windows® 95 and MS Plus! CD
- Microsoft Office Pro 95 & Bookshelf 95 CDs
- 5-year/3-year Micron Power[SM] warranty*

- 16MB EDO RAM
- 1.0GB EIDE hard drive
- 15" Micron 15FGx, .28dp (13.7" display)

$2,699
Bus. lease $92/mo.

- 32MB EDO RAM
- 1.6GB EIDE hard drive
- 17" Micron 17FGx, .26dp (15.8" display)

$3,299
Bus. lease $112/mo.

MILLENNIA PRO PLUS200

- Intel 200MHz Pentium Pro processor
- 256KB internal cache, flash BIOS
- PCI 32-bit Ultra SCSI Fast-20 controller
- 8X SCSI-2 CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- PCI 64-bit 3D video, MPEG, 2MB EDO
- *Tool-free* minitower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows NT Workstation 3.51 CD or Windows® 95 and MS Plus! CD
- Microsoft Office Pro 95 & Bookshelf 95 CDs
- 5-year/3-year Micron Power warranty*

- 32MB EDO RAM
- 2GB Fast SCSI-2 hard drive
- 15" Micron 15FGx, .28dp (13.7" display)

$3,699
Bus. lease $127/mo.

- 64MB EDO RAM
- 4GB Fast SCSI-2 hard drive
- 17" Micron 17FGx, .26dp (15.8" display)

$4,799
Bus. lease $151/mo.

- 128MB EDO RAM
- 9GB Fast SCSI-2 hard drive
- 21" Micron 21FGx, .26dp (20.0" display)

$7,899
Bus. lease $244/mo.

CLIENTPRO™ P100

- Intel 100MHz Pentium® processor
- 256KB pipelined burst cache, flash BIOS
- 3COM 3C509 Combo network adapter
- 3.5" floppy drive
- *Tool-free* minitower or desktop
- Microsoft® Mouse, 104-key keyboard
- Microsoft DOS 6.22/Windows® for Workgroups 3.11
- 5-year/3-year Micron Power[SM] warranty*

- PCI 64-bit graphics accelerator (1MB EDO)
- 8MB EDO RAM
- 1.0GB EIDE hard drive
- 14" Micron 14FGx, .28dp (12.9" display)
- Microsoft Works preinstalled

$1,499
Bus. lease $51/mo.

- PCI 64-bit graphics accelerator (2MB EDO)
- 16MB EDO RAM
- 1.0GB EIDE hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- Microsoft Office Pro 4.3 preinstalled

$1,943
Bus. lease $66/mo.

CLIENTPRO P166

- Intel 166MHz Pentium processor
- 256KB pipelined burst cache, flash BIOS
- 3COM 3C509 Combo network adapter
- 32MB EDO RAM
- 2.1GB EIDE hard drive
- 3.5" floppy drive
- 8x EIDE CD-ROM drive
- PCI 64-bit graphics accelerator (2MB EDO)
- 17" Micron 17FGx, .26dp (15.8" display)
- *Tool-free* minitower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows NT Workstation 3.51 CD
- Microsoft Office Pro 95 & Bookshelf 95 CDs
- 5-year/3-year Micron Power warranty*

$3,282
Bus. lease $112/mo.

Micron Power Warranty & Support

- 5-year limited warranty on microprocessor and main memory
- 3-year limited parts-only system warranty
- 1-, 2- or 3 year optional on-site service agreement for all desktop systems
- 30 days of free Micron-supplied software support
- 30-day money-back policy
- 24-hour technical support

All sales are subject to Micron's standard limited warranties and terms and conditions of sale. Copies of the limited warranties may be obtained on our web site or by calling Micron.

International Sales 208-893-8970 • International Fax 208-893-7393

Toll-free from Canada 800-708-1758

Toll-free from Puerto Rico 800-708-1756

Toll-free from Mexico 95-800-708-1755

MICRON™
ELECTRONICS, INC.

800-554-5230

900 E. Karcher Road, Nampa, ID 83687 • Mon-Fri 6am-10pm Sat 7am-5pm (MST) • International Sales Hours: Mon-Fri 6am-7pm (MST) • 208-893-3434 • Fax 208-893-3424
Purchase Order Fax 208-893-8932 • Technical Support Available 24 Hours A Day / 7 Days A Week • Technical Support E-mail: tech.support.mail@micron.com

©1995 Micron Electronics, Inc. All rights reserved. Micron Electronics is not responsible for omissions or errors in typography or photography. All purchases are subject to availability. Prices and specifications may be changed without notice; prices do not include shipping and handling. 30-day money-back policy does not include return freight and original shipping/handling charges; applies only to Micron brand products and begins from date of shipment. All sales are subject to Micron Electronics' current terms and conditions of sale. Lease prices based on 36-month lease. Intel, and Inside and Pentium are registered trademarks of the Intel Corporation. Microsoft, Windows and the Windows logo are registered trademarks and Windows NT is a trademark of Microsoft Corporation. All other service marks, trademarks and registered trademarks are the property of their respective companies.
TPMMIL/CLP-C95ED-0000

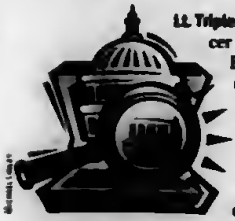
Encore Media's Starz movie channel has created The Twilight Man Society, a Web site (twilightman.com) that focuses on the issues of harassment and invasion of privacy via computer technology. The site was developed in conjunction with the release of a cable TV movie *The Twilight Man*, which involves a mysterious man who harasses a professor by altering his medical records. The site has a few links to privacy resources, but it doesn't have links to heavy-hitter sites such as the Electronic Privacy Information Center (www.epic.org) and the Electronic Frontier Foundation (www.eff.org).



alt.cw

The state of Nebraska plans to allot 2 cents of the 34 cents per pack it collects in cigarette taxes to help pay to fix the year 2000 problem in state computer systems, the *Omaha World-Herald* reported. The cigarette tax revenue would cover about $11 million of the $30 million date-conversion project.

Twenty-four U.S. agencies are scrambling to meet an Aug. 8 legislative deadline to establish the position of chief information officer, *Washington Technology* reported. The job pays $115,700 a year.



Lt. Triplet, the "Doonesbury" comic strip's morale officer for U.S. troops in Bosnia, can effortlessly send E-mail from Bosnia to the States. But *Federal Computer Week* reported that, because of a major technical glitch, real E-mail from U.S. soldiers in Bosnia is more likely to go into "a black hole" than to a loved one back home.

CompuServe thought it had a great, civic-minded idea to offer election candidates free access to CompuServe and the Internet to encourage on-line chats with the electorate. But the Federal Election Commission ruled that the free membership would be the equivalent of an in-kind corporate donation to candidates and is thus forbidden under current law.

Local governments that need an ordinance on barking dogs or graffiti don't need to reinvent the wheel, *Government Technology* reported. They can visit Municipal Code's Web site at www.municode.com and copy well-vetted ordinances from other municipalities.

South Korea warned its citizens not to contact North Koreans via the Internet, Reuters reported. South Koreans who access Web sites in North Korea will be punished under the National Security Law, which bars unauthorized contact with North Korea, prosecutors said.

■ **Send contributions of offbeat news, lists and anecdotes to mbetts@cw.com.**

Digital Frontiers

The good news is that many corporations are scrambling to write "Internet usage policies" that cover what employees can and can't do on the 'net. The policies typically have warnings against misusing copyrighted material, downloading pornography and sending harassing or libelous messages.

The bad news is that almost three out of five corporations still don't have such a policy. The survey, which had 119 respondents, was conducted by Gordon & Glickson, a computer law firm based in Chicago. The survey also found 62% don't have restrictions on downloading data, which increases the risk of virus infections.

Companies worried about the legal risks of cyberspace can also check out liability insurance coverage from Poulton Associates, Inc. in Salt Lake City. The firm offers information and rate quotes on its Web site: www.poulton.com. — *Mitch Betts*



Computer animators can use the CyberGlove from Virtual Technologies in Palo Alto, Calif., to make real-looking hand motions on screen. The glove has 18 sensors stitched into stretch fabric to determine how the fingers bend. The signals are sent by serial cable to a PC running the vendor's VirtualHand software. The gloves shown above have the CyberTouch "tactile feedback" option, which has small stimulators programmed to make users feel as though they are really touching the virtual object.



Mobil gas stations across the U.S. are rolling out the Friendly Serve program, which features old-fashioned service from attendants — even at self-serve pumps — and quicker transactions. Joe Minai, retail automation manager at Mobil headquarters in Fairfax, Va., said simplified keypads on the pay-at-the-pump terminals, faster processors and software changes will reduce point-of-sale transaction times by 30 seconds.

News shorts

MVS to support SAP R/3

IBM and **SAP AG** are targeting the week of Aug. 26 to announce MVS database support for R/3, said Hasso Plattner, vice chairman at SAP, in an interview with *Computerworld* last week.

The move will let SAP's mainframe R/2 customers retain mainframe-like data management and systems administration but move to client/server systems. Plattner said 60% of SAP's 1,800 R/2 users run MVS. They are mostly in the insurance and banking industries. He said SAP won't formally announce MVS support until it is within six months of shipping to customers. But he expects that announcement will be made at SAP's U.S. user group meeting in Philadelphia, Aug. 26-29.

Speedier Web browser

America Online, Inc. last week announced a new version of its client software that includes a new World Wide Web browser built for speed.

The new America Online client for Windows users is due this month. America Online officials said the built-in Web browser supports throughput speeds that are 30% faster than **Netscape Communications Corp.**'s Navigator or **Microsoft Corp.**'s Internet Explorer on a conventional dial-up Internet service. That's a big change for America Online, whose users complain its Web browser is creakingly slow.

The online service is swimming against the tide. Its three biggest competitors have begun to move their proprietary services to the Web, but America Online is sticking with its proprietary service.

David Gang, America Online's vice president of marketing in Vienna, Va., said proprietary software offers ease of installation and fast throughput that the Web still can't match. America Online users can still access the Web from America Online's client software, he said.

"There is no benefit to the consumer in going [directly] on the Web," Gang said. "It's a ludicrous concept. The best thing that ever happened to America Online was everybody else going on the Web. They're all focused on standards; they're not focusing on the customer experience."

Speaking of AOL . . .

America Online has signed an agreement to integrate and distribute **Macromedia, Inc.**'s Shockwave to subscribers. This follows Macromedia's announced partnership last week with Microsoft to integrate Shockwave with Microsoft's ActiveX technologies and Internet Explorer 3.0. Macromedia signed similar deals with Netscape and **Apple Computer, Inc.** earlier this year.

For more **News shorts**, *see page 8*



IS YOUR BACKUP TOUGH ENOUGH FOR THE JOB?

Is your critical data guarded by a puny backup solution that doesn't scale up? Backup Express™, new from Syncsort, is fast and powerful, designed specifically for today's distributed networks, where the data grows every day. Backup Express™ backs up and restores gigabytes of data fast—whether on UNIX, NetWare, or Windows NT. If you want a backup strong enough to keep your network data secure and bring it back fast, call us.

syncsort

Tel (201) 930-8200 dept. 66CWB
Fax (201) 930-8290 dept. 66CWB
http://www.syncsort.com

©1996 Syncsort Incorporated. All trademarks are property of their respective owners.

Sybase pins revival on becoming Internet player

By Dan Richman
WALTHAM, MASS.

Sybase, Inc. has hitched its comeback wagon to the Internet, hoping to recast itself as a preferred supplier of business technology for the World Wide Web.

At a strategy briefing here last week, Mitchell Kertzman, executive vice president of sales and marketing, said Sybase could repeat on the 'net the kind of runaway success that Powersoft Corp. had with PowerBuilder in client/server development.

Database technology

Sybase customers said they certainly would like to see that happen for their embattled database vendor, which has struggled through various financial, organizational and product difficulties in the past year.

"From products we have in-house, I know Sybase is serious about the Internet," said Bill Niemi, a chairperson of the International Sybase Users' Group. "I applaud the steps they're taking to let people know about themselves."

As it gears up for its Internet push, the company will continue to expand its middleware, development tools and relational database management systems offerings, Kertzman said. The company's marketing message is being recast to appeal to a broader business audience. Sybase in the past has focused mainly on information systems staffers and database technicians.

"When technical people do an evaluation, Sybase always gets the nod," said James M. Echter, national sales manager at Information View, a Sybase development partner in Rochester, N.Y. "But now I'm seeing Sybase approaching top execs with teams of salespeople with some background in the industry they're dealing with. I've never seen that before."

An essential ingredient in Sybase's Internet effort will be PowerBuilder 5.0, which started to ship last week.

In its latest version, this development environment gained the ability to create application servers. These servers accept requests for data from Internet browsers, access databases and then return data to a browser. That data may appear in a Hypertext Markup Language format or as a PowerBuilder data window or application.

This means every application created with PowerBuilder during the five years it has been available can be converted to an Internet application by migrating it to Version 5.0.

Developers are expected to applaud this capability because it would reduce the burden of converting old applications from client/server to the Internet and enable the creation of new applications that run interchangeably on networks and browsers.

Most analysts and users said the strategy briefing buoyed their hopes for Sybase.

'net forces laud ruling

Court throws out online Decency Act

By Gary H. Anthes

In a resounding repudiation of Internet regulation, a federal court last week ruled that a new law that seeks to block online access to indecent material is an unconstitutional violation of free speech.

The action removes a cloud of uncertainty that had been hanging over Internet service providers and information systems managers fearful the law might snare them unawares.

Matthew Cutler, president of Webmaster'a Guild, Inc. in Cambridge, Mass., said the ruling is a victory for IS managers who, under the law, could have been prosecuted for content on their Web sites even if the material was put there by someone else.

Cutler said the law had a chilling effect on the guild's 1,500 members, many of whom removed things from their Web sites after the law was passed. "There is content out there that in today's politically correct environment could be seen as objectionable, while other people perceive it as perfectly OK," he said.

A three-judge panel in Philadelphia issued an injunction against enforcement of the Exon-Coates Communications Decency Act of 1996, which criminalized the distribution or display of indecent material accessible by children on the Internet.

"This is a major victory for the Internet and a major victory for free speech," said Jerry Berman, executive director of the Center for Democracy and Technology in Washington.

The lifting of the legal cloud was hailed by major online service providers as well. "The ruling removes a great deal of uncertainty and will allow us to move much more aggressively in the marketplace," said William Burrington, director of law and public policy at America Online, Inc.

While the ruling dealt most directly with free speech rights, legal experts said it will serve as a landmark to guide Congress and the courts on other issues, such as privacy, libel and copyrights in cyberspace.

"This opinion will be required reading from now on for anyone who wants to understand the Internet and how it works," said Bruce Ennis Jr., a Washington attorney who led the opposition to the law.

The government has 20 days in which to appeal the ruling to the Supreme Court. Ennis predicted a win on appeal because the lower court meticulously compiled more than 100 pages of "findings of fact" about the Internet and how it works.

The Supreme Court would be unlikely to challenge that foundation, Ennis predicted.

Excerpts from the court decision on the Communications Decency Act follows. Full text of the decision can be found at www.cdt.org

- "As the most participatory form of mass speech yet developed, the Internet deserves the highest protection from government intrusion."
- "Any content-based regulation of the Internet, no matter how benign the purpose, could burn the global village to roast the pig."
- "Just as the strength of the Internet is chaos, so the strength of our liberty depends upon the chaos and cacophony of the unfettered speech the First Amendment protects."



Concert service steps up the beat

By Kim Girard

Concert, the global telecommunications carrier run jointly by BT and MCI Communications Corp., will soon roll out a high-speed ATM backbone network for corporate Internet users who need guaranteed service performance.

Concert InternetPlus service, scheduled to debut in October, will let multinational businesses use a global network for groupware, electronic mail and electronic commerce.

For Lenny Kutorsky, chief information officer at Internet Trade Line, Inc., a New York-based international trade network, the new service "means a great deal."

"We're in 11 countries and expect to be in 20 countries by the end of the year," Kutorsky said. "Internet access is a problem for our customers overseas, especially in Europe. For them to fully utilize our services, they need industrial-strength service."

Concert offers its customers

- High-speed dedicated access of up to 45M bit/sec. to the Concert Internet network
- The option to establish intranets for enterprise messaging, including E-mail, phone mail, fax and document sharing among employees
- Dedicated and dial-up access from more than 1,200 locations in 70 countries

Traffic on the private network is expected to move faster than it does on the congested, public Internet, MCI officials said.

The service will provide dial-up and dedicated access to the core network, which will have an Asynchronous Transfer Mode (ATM) backbone. It also allows companies to establish global intranets for E-mail, voice mail, fax and document sharing.

The Concert strategy will bring multinational Internet customers onto their own private toll road. That way, more money can be made and service can be guaranteed, said Tom L. Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. In the future, providers increasingly "are going to have to distinguish between easy, sleazy consumer access and business access," Nolle said.

Sprint Corp. last year took a step in this direction through its partnership with Deutsche Telekom and France Telecom and now has hubs in 30 countries.

Single network

InternetPlus differs from global services offered by BBN Corp., UUnet Technologies, Inc. and others because it is managed by one entity from end-to-end on one network. Other global services require linkages among multiple Internet service providers.

But MCI's contention that this service will reduce congestion on the public Internet is far-fetched, said Eric Paulik, a research analyst at Gartner Group, Inc. in Stamford, Conn.

"Yeah, you could have less congestion, but that doesn't take into consideration the growth and the number of people getting on the Internet," he said. "What will help the congestion problem is more agreements between the [Internet service providers]."

Concert InternetPlus will be connected by eight new regional superhubs in Australia, Germany, the Netherlands, Japan, the U.K. and the U.S.

Pricing for the new offering has yet to be announced.

Online services are Web-bound. See page 73.



Suddenly, ICE Is The Hottest Thing On The Internet.

Everybody's been talking about doing business on the Net. And now, you can. Thanks to a new product from Computer Associates called CA-Unicenter/ICE™. ICE stands for "Internet Commerce Enabled.™" That's a fancy way of saying, this software is designed specifically to handle the unique requirements and challenges of the Internet.

CA-Unicenter/ICE is a distributed management software solution that secures and manages Windows NT and UNIX servers on the Internet and other TCP/IP networks. It's the first product that addresses all the management needs of Web servers and Web clients by providing security, event management, help-desk, storage management, resource accounting and database monitoring. So now you can have a secure, reliable and manageable Internet infrastructure.

Call 1-800-225-5224 for more information.

Visit us at http://www.cai.com and find out how a little ICE can lead to a lot of new business.

COMPUTER® ASSOCIATES
Software superior by design.

Introducing New CA-Unicenter/ICE™

© 1996 Computer Associates International, Inc., Islandia, NY 11788-7000. All products referenced herein are trademarks of their respective companies.

Microsoft builds Web into OS

By Mitch Wagner and Kim S. Nash
SAN JOSE, CALIF.

Microsoft Corp. last week added more meat to its PC-centric plan to build World Wide Web functions into future versions of its Windows operating systems, bucking a trend to separate the 'net from the operating system.

The strategy includes adding Web-style navigation methods to Microsoft's Office applications suite; adding a Web server, search engine and development tools to Windows NT; and merging the Windows desktop and Web browser.

The plan, outlined at the company's Intranet Strategy Day here last week, won support from some users and analysts in part because corporate Web applications can be managed with utilities already in NT, they said (see related story below right).

Blurring lines between Web products and Windows NT "is a great idea," said Chip Wickenden, manager of electronic commerce at Barnett Banks, Inc. in Jacksonville, Fla.

"They hit IS managers where they live," said Rob Enderle, an analyst at Giga Information Group in Santa Clara, Calif. "They showed IS managers how they can be heroes in their organization." Microsoft's strategy will enable information systems managers to cut costs and improve employee productivity, he explained.

Microsoft's Internet strategy differs from those of operating systems rivals such as IBM, Novell, Inc. and Sun Microsystems, Inc. They see Web functionality and system software as separate animals rather than a hybrid.

Microsoft and Internet rival Netscape Communications Corp. also differ in their approaches to intranet, or internal Web, applications.

Different approach

While Netscape wants to coax IS shops to build often entirely new Web applications, Microsoft contends that adding Web concepts to existing software is smarter.

Some users agreed.

"What's important is to be able to use the Internet as a front end to applications like Word and Excel and Access, rather than rely on having a lot of different applications for access," said Anthony Pizi, vice president of advanced office systems and technology at Merrill, Lynch & Co. in Princeton, N.J.

Microsoft outlined a strategy last week in which all that data will be accessible using a Web browser. Internet functions will be written in to Windows, Windows NT and other Microsoft packages.

Microsoft also trotted out some product specifics. For example, a new search engine, code-named Tripoli, will be built in to Windows NT 4.0. FrontPage, comprising Web development tools inherited in the January buyout of Vermeer Technologies, Inc., will also be folded into NT 4.0.

The following products were also demonstrated at the conference:

- Internet Explorer 4.0, a Web browser merged with a new version of Microsoft's 32-bit Windows user interface that lets application icons and Web documents sit side by side. It is due out by year's end.
- Viper, a server designed to let users build and run large client/server applications by using the ActiveX programming interface.
- A proxy server code-named Catapult that lets webmasters manage user-access privileges to Web applications.

Users hesitant to buy software electronically. See page 61.

Netscape does intranets

With no apologies to recently minted author Bill Gates, Netscape outlined "The Road Ahead" last week.

Netscape's Web servers and browsers will be expanded and partly rewritten to appeal to corporate IS groups that build intranet applications, the Mountain View, Calif.-based vendor said.

For example, Orion, the code name for the next version of Netscape's SuiteSpot set of Web servers, will give Netscape the same electronic-mail and groupware capabilities as Notes and other more established products.

Galileo, meanwhile, refers to the next release of the Navigator browser. Due out by year's end, it will allow users to encrypt E-mail and support Lightweight Directory Access Protocol, a subset of X.500 directory services, among other new features.

— Kim S. Nash

180 degrees of separation

Microsoft and Netscape spout opposing Internet philosophies

	Microsoft	Netscape
	Part of the basic PC user interface	Separate PC application
	Development tools added to operating system, and Web features added to existing tools	Some tools built in to special, more costly version of browser
	Function built in to Windows NT	Separate package for multiple platforms

NT directory service finally unveiled

Microsoft ended months of suspense last week and demonstrated an enterprise-wide directory service that [illegible] in Cairo, the next generation [illegible] down NT.

The demonstration [illegible] at last week's Intranet Strategy Day in San Jose, Calif. Steven Ahee in MS-crunch, who requested [illegible] said the company will [illegible] view the Cairo directory this [illegible] begin beta testing early next year. Cairo is expected to ship in the second half of next year.

The Cairo enterprise directory is the missing piece of Microsoft's network operating system strategy. It is needed to make it easy for administrators to centrally locate and manage geographically dispersed networks [illegible] with an enterprise, hierarchical and graphical picture of every user and [illegible] It is similar [illegible] Directory Services. [illegible] be able to do [illegible] delegation of responsibilities, such as the ability to manage printers, peripherals or files on particular file servers. They will also be able to prune and merge users and objects into different branches on the tree or different nodes of the network. *— Laura DiDio*

Office 97 gains new Outlook on information sharing

By Lisa Picarille

Microsoft Office 97, due at year's end, will be packed with World Wide Web-related document management features and a desktop information management application named Outlook.

The company last week outlined plans to exploit the Web through the company's best-selling Office suite of products.

As part of the major Office upgrade, Microsoft said it will add Outlook, a superset of Schedule+ that previously had been dropped from the suite.

Outlook was designed as an internal messaging and collaboration system that lets Office users share electronic mail, schedules, tasks, contacts and files. It also has been integrated with Microsoft Exchange, a groupware product that competes with Notes, to let Office users share information with non-Office users on Exchange servers.

"We've been waiting for this kind of product for a while," said John Tredennick, chief information officer and partner at law firm Holland & Hart in Denver. Holland & Hart switched from WordPerfect Office to Microsoft Office.

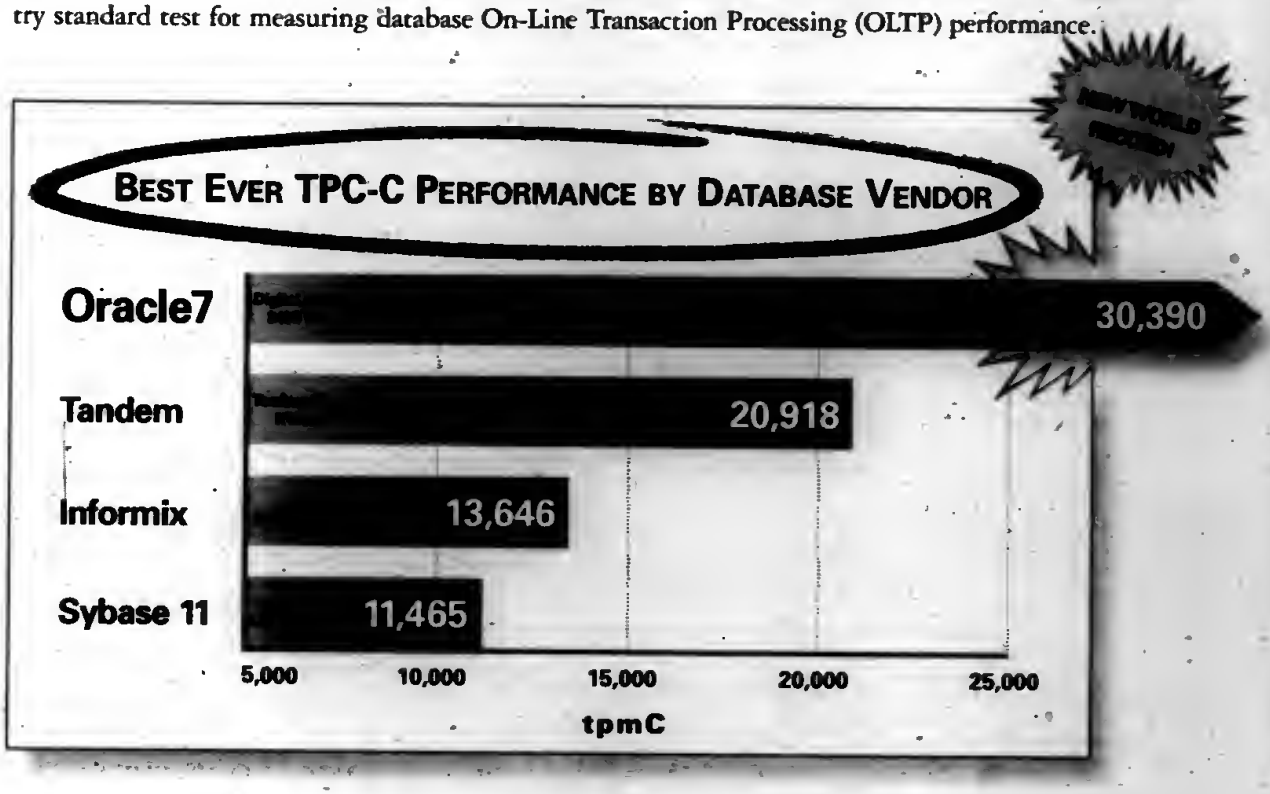
"WordPerfect for DOS used to have something with similar capabilities but very rudimentary. When we made the switch to Office, a lot of us were left wanting something to share names, contacts, etc. So we wrote it ourselves using Visual Basic. It would be easier on us if those capabilities were integrated ... into Office."

Some industry watchers questioned whether the Web and collaborative features are enough to get users to upgrade to Office 97.

But one user, who requested anonymity, said Office 97 was "extremely slick," and users will be "totally happy campers" about the Web functionality.

Oracle7 Parallel Server: Safe at any Speed

Oracle7 Parallel Server™ breaks Tandem's TPC-C world record! The TPC-C benchmark is the industry standard test for measuring database On-Line Transaction Processing (OLTP) performance.



"Oracle has a superb solution for enterprise-class OLTP. They have literally achieved results we only dreamed of a few years ago."—**Peter Kastner, Vice President, Aberdeen Group**

Oracle Parallel Server enables multiple computers to simultaneously access the same database. Multiple computers working together means you get record breaking performance, and there is no single point of failure in the system. If one of those computers should fail—your application continues to run on the other machine(s). If you love speed but don't want to crash, call us at 1-800-633-1071, ext. 8130 or find us on the Web at **http://www.oracle.com**. If crashing at low speed seems OK, call Informix or Sybase. They just haven't been able to make multiple computers work together yet.

ORACLE®

Enabling the Information Age™

©1996 Oracle Corporation. Oracle is a registered trademark, and Oracle7 Parallel Server and Enabling the Information Age are trademarks of Oracle Corporation. All rights reserved. TPC-C results as of April 17, 1996. TPC is a registered trademark of the Transaction Processing Performance Council. Oracle on Digital AlphaServer 8400 TruCluster configuration, four systems with 8 CPUs, 30,390 tpmC at $305/tpmC. Informix on Digital AlphaServer 8400 system with 10 CPUs 13,646 tpmC at $277/tpmC. Sybase on Sun Ultra Enterprise 5000 system with 12 CPUs 11,465 tpmC at $198/tpmC. *Results for Tandem on Tandem Himalaya K10000-112 system with 112 CPUs 20,918 tpmC at $1,151/tpmC were withdrawn April 12, 1996 and no longer represent official TPC results. All other company and product names are trademarks of their respective owners.

Limits of the 'net

Vendors alter tools to facilitate app development

By Frank Hayes

Corporate application developers are finding that the World Wide Web isn't quite ready for prime time.

As developers work to build the next generation of client/server applications on the Web, the limitations of development tools and the Internet itself are getting in the way.

"The tools will have to get to a certain level before most people will say, 'I can use this,' " said Paul Mundell, a decision-support specialist at Warner Brothers, Inc., a division of Time Warner Entertainment Co. in New York.

"The bottleneck now is the tools," agreed Michael Brando, an engineering manager at Perkin-Elmer Corp. in San Jose, Calif. "We can't get them from the vendors soon enough."

Tool vendors, including Microsoft Corp., Oracle Corp., Powersoft Corp., Centura Software Corp., are retrofitting their visual development systems to let users build Web applications and conventional client/server software.

The new development systems, which are scheduled to arrive within months, will let any user with a Web browser access client/server applications. But some more adventurous information systems shops are plowing ahead — and that can turn up unexpected problems.

"When you start Web-based development, a whole set of complexities comes into play that don't seem obvious until you really begin to do it," said Alan F. Nugent, chief technology officer at the global strategy and advanced technology group of Xerox Corp. in Rochester, N.Y.

Those complexities include making sure each user has a private session and security, reliability and performance issues. Developers are also concerned about Web browsers, which lack standards for displaying documents.

"We're eager to use plug-ins and add-ons, but we're cutting our own throats," said Rick Brennan, manager of Web services at National Semiconductor Corp. in Santa Clara, Calif. "We really need a baseline so I don't have to worry about what operating system or browser or plug-in a user has."

Also of concern is how slowly screens appear across the ever-more-crowded Internet.

WebMate links Web pages, databases. See page 76.

Get ready to Mambo

Open Environment Corp. in Boston this week will begin shipping a Web connection for its Enterra application middleware.

The Mambo tool set, which will let developers build Web applications that link to mainframe and relational databases, will cost $2,495 per developer. It runs on versions of Unix from IBM, Hewlett-Packard Co. and Sun Microsystems, Inc., with a version for Windows NT slated to ship in July.

And last week Centura Software Corp. said it will add Web support to its high-end Centura Developer tool set. Centura Web Developer, which will ship in the third quarter, will let Windows 3.1- and NT-based developers use the Web to deploy applications originally designed for Windows-based PCs. Pricing wasn't announced. — *Frank Hayes*

Banyan's BeyondMail delivers improved message management

By Tim Ouellette

Banyan Systems, Inc. is helping users cope with electronic-mail overload and beefing up its Internet mail software.

The company last week announced that BeyondMail 3.0 Internet Edition will automatically download certain messages based on user criteria and filter messages from discussion lists.

For example, messages from a high-volume discussion group on a new project can be automatically routed to a special folder. Or, E-mail asking for certain approvals can be automatically sent to the appropriate manager. The Internet Edition can also run Microsoft Corp. ActiveX-based applets based on user-defined requirements.

Internet E-mail

Trying to get in the running

Recently, Internet E-mail vendors have attempted to boost the security, administration and management features of their products to help compete with the more robust offerings from proprietary messaging products such as CC:Mail, Exchange and GroupWise.

With the improved rules features in BeyondMail, Banyan officials said they hope to let users create what they call "business on mail" applications. These applications combine rules-based filtering with electronic forms and require minimal programming.

For example, users can set up a time-keeping system that lets them fill out time sheets in a mail message. The system automatically routes the sheets to managers for approval and then to other departments for payment.

"They have made the scripting of rules-filtering more procedural, giving us more functionality," said Loonie Clardy, an associate consultant at The Network Technology Group in San Jose, Calif.

Because all BeyondMail messages are essentially forms, users have more flexibility in sorting and organizing their mail. Users can create forms within the program — where before this required a separate module — so it will be easier to exploit the product's features, Clardy added.

Several standard applets will be included with the product. Mail Minders, which are automated helpers driven by dialog boxes, are also included to help users quickly manage folders and their in-box.

The Internet E-mail client will ship this fall. Pricing hasn't been announced.

Support for Internet security protocols, Microsoft's Messaging Application Programming Interface and the new Internet Message Access Protocol is slated for year's end.

Personal	Private directories.
Workgroup	A shared directory for a limited number of users.
Enterprise	Based on StreetTalk's services for organizational directory. Users can use any Lightweight Directory Access Protocol server.
Global	Access Switchboard, Banyan's Web-based white pages at www.switchboard.com.

News Shorts

Cabletron widens Spectrum by hooking up with BMC

This week **Cabletron Systems, Inc.** in Rochester, N.H., will reveal a significant boost to the systems and application capability of its Spectrum network management platforms. **BMC Software, Inc.** is the latest in a series of vendors that are partnering with Cabletron to integrate their tools with Spectrum and ease end-to-end management.

Gigabit Ethernet group grows

The fledgling Gigabit Ethernet Alliance, which was formed last month to develop Ethernet products that operate at 1G bit/sec., picked up steam last week with the addition of 28 members, including **Cabletron, Digital Equipment Corp.** and **Xylan Corp.** The first Gigabit Ethernet switch, from **NBase Communications, Inc.**, is due in August.

PC: Heal thyself with suite

A PC's ability to "repair itself" will take a leap forward this week when **SystemSoft Corp.** in Cambridge, Mass., **Intel Corp.** and **Digital** introduce a suite of software products that identify, diagnose and resolve common PC usage and configuration problems at a user's PC. The product, SystemWizard, will be bundled with new PCs, peripherals and software applications beginning later this year.

SCO Comet landing delayed

With its focus more on UnixWare these days, **SCO, Inc.** has postponed plans to revamp its low-end OpenServer operating system. Some initial pieces of a promised new version, code-named Comet, were introduced last week as an add-on to OpenServer Release 5. But key features such as built-in support for Sun Microsystems, Inc.'s Java programming language and increased memory addressing capabilities will now debut in a series of updates that extend out to year's end, SCO said.

Sabre Group names first CIO

The Sabre Group has appointed Terrell B. Jones as the first chief information officer of the Fort Worth, Texas-based transportation services firm.



Jones, who was most recently president of Sabre Computer Services, will continue as president of Sabre Interactive, the Sabre Group business unit responsible for consumer-direct electronic distribution.

NetManage and the jets

JetMail and ZMail users can relax. Their Internet electronic-mail systems will continue to be supported by Cupertino, Calif.-based **NetManage, Inc.**, which bought ZMail earlier this month. This will occur even though NetManage will develop a new E-mail system based on features in both products.

Microsoft, TI repository

Microsoft Corp. and **Texas Instruments Software** in Plano, Texas, have finished design work on their long-awaited repository for building applications using Microsoft's OLE components. The repository is due to ship by year's end.

SHORT TAKE **Pacific Bell Network Integration**, a subsidiary of the **Pacific Telesis Group** in San Francisco, has allied with **IBM**'s Integrated Systems Solutions Corp. to offer monitoring and maintenance of PC networks. ... **Bell Atlantic Nynex Mobile** in Bedminster, N.J., has reduced usage charges for its Cellular Digital Packet Data usage plans by more than 70%. The rates will range from 4 to 15 cents per kilobyte.

51 Issues for $48

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name _____ MI _____ Last Name _____

Title _____ Company _____

Address _____ City _____ State _____ Zip _____

Address Shown: ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate: $48 per year

* U.S. Only. Canada $65. Mexico, Central/South America $150, Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
99. Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

10. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin.Sys.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
50. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

80. Information Centers/Libraries, Educators, Journalists, Students
99. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTStep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

COMPUTERWORLD

8266-9

Recycled Paper



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

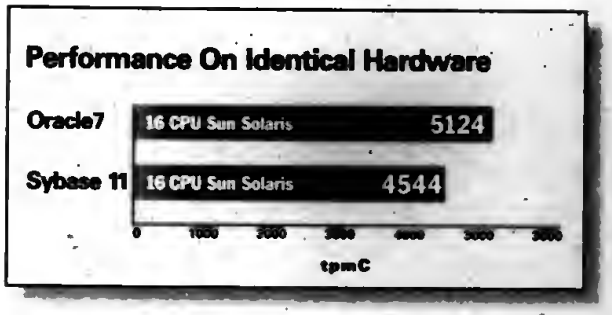
BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

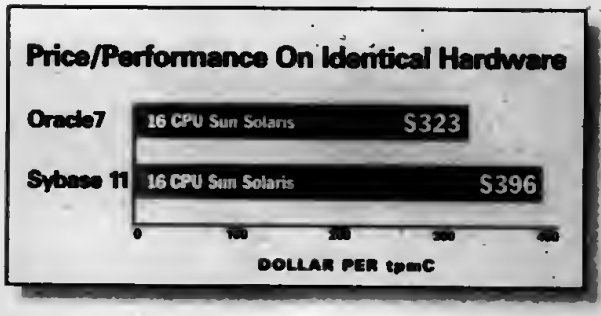
COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-2144

Oracle Universal Server

Faster



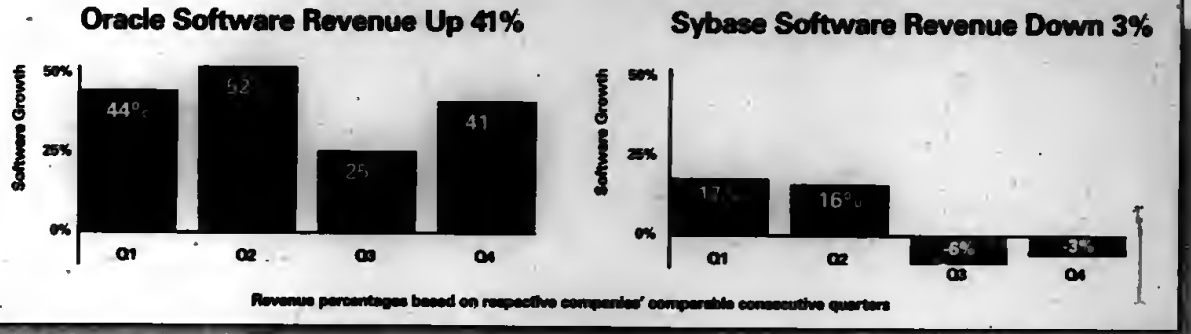
Cheaper



Better

Oracle7	Sybase 11
☑ Universal Server: Tables, Text, Image, Audio, Video	"Sybase, which has yet to discuss its plans for such a server, is viewed as lagging in this area." — Network World
☑ Parallel Server: Query, Index & Recovery	"Sybase...has scalability problems with its System 11 release." — Information Week
☑ Concurrent Server: Row-Level Locking	"Sybase System 11...does not support row-level locking." — Information Week

The Market Has Spoken



So which would you choose? Oracle. Always faster, cheaper and better. Call 1-800-633-1071, ext. 8128.
Or find us on the Web at http://www.oracle.com

ORACLE®

Enabling the Information Age™

©1996 Oracle Corporation. Oracle and Universal Server are registered trademarks, and Oracle7 and Enabling the Information Age are trademarks of Oracle Corporation. All rights reserved. TPC results as of March 1, 1996. TPC is a registered trademark of the Transaction Processing Council. Oracle 16 CPU Sun Solaris, 5,124 tpmC, $323/tpmC. Sybase 16 CPU Sun Solaris, 4,544 tpmC, $396/tpmC. Oracle figures reflect test of December 1, 1994–November 30, 1995. Sybase figures reflect test of January 1, 1995–December 31, 1995. All other company and product names are trademarks of their respective owners.

HP outlines plan to close OpenView gaps

By Patrick Dryden

Users of OpenView management software who gather next week in St. Louis for their annual conference will get hands-on help with current problems and a heads-up briefing on missing pieces from Hewlett-Packard Co.

The vendor-independent OpenView Forum, based in San Francisco, expects more than 1,000 attendees at the weeklong exposition and series of briefings, tutorials and demonstrations.

One hot topic will be the continued evolution of OpenView from primarily a network management platform into a full framework that also maintains workgroups, systems and applications.

HP will push OpenView IT/Operations, introduced earlier this year for a summer rollout. That package combines the market-leading Network Node Manager with tools for systems management, software distribution and other functions found previously in OpenView Operations-Center.

With such integrated suites, operators can see both sides of a problem that hits a client/server network. When a red alert warns of service interruption, they can investigate a database, its server and all LAN connections, for example, from a single console.

Systems management

"Like many corporations, we're trying to combine network and systems management through both tools and organizational changes. We want one group of engineers responsible for all parts of our environment, to facilitate the centralization of management," said Sandy Potter, telecommunications engineer at Air Products & Chemicals, Inc. in Allentown, Pa., and an OpenView Forum officer.

But for most attendees, OpenView still means just Network Node Manager and tools that build on its discovery, mapping and alarm handling. Therefore, many sessions will focus on upgrading to and taking advantage of the distributed architecture in Version 4.1, released in April.

Support needed

Migration and tool support are crucial for attendees from Chevron Information Technology Co. in San Ramon, Calif.

"We suffer performance problems now with our database of 60,000 managed objects, way past what Network Node Manager supports," said T. X. Ho, senior communications engineer at Chevron. "That limits our ability to manage, so we need 4.1 to improve performance and distribute management among remote sites."

Ho said Chevron network managers plan to test Network Node Manager 4.1 next month, but he added that he fears other vital tools won't work with the new version until October or later.

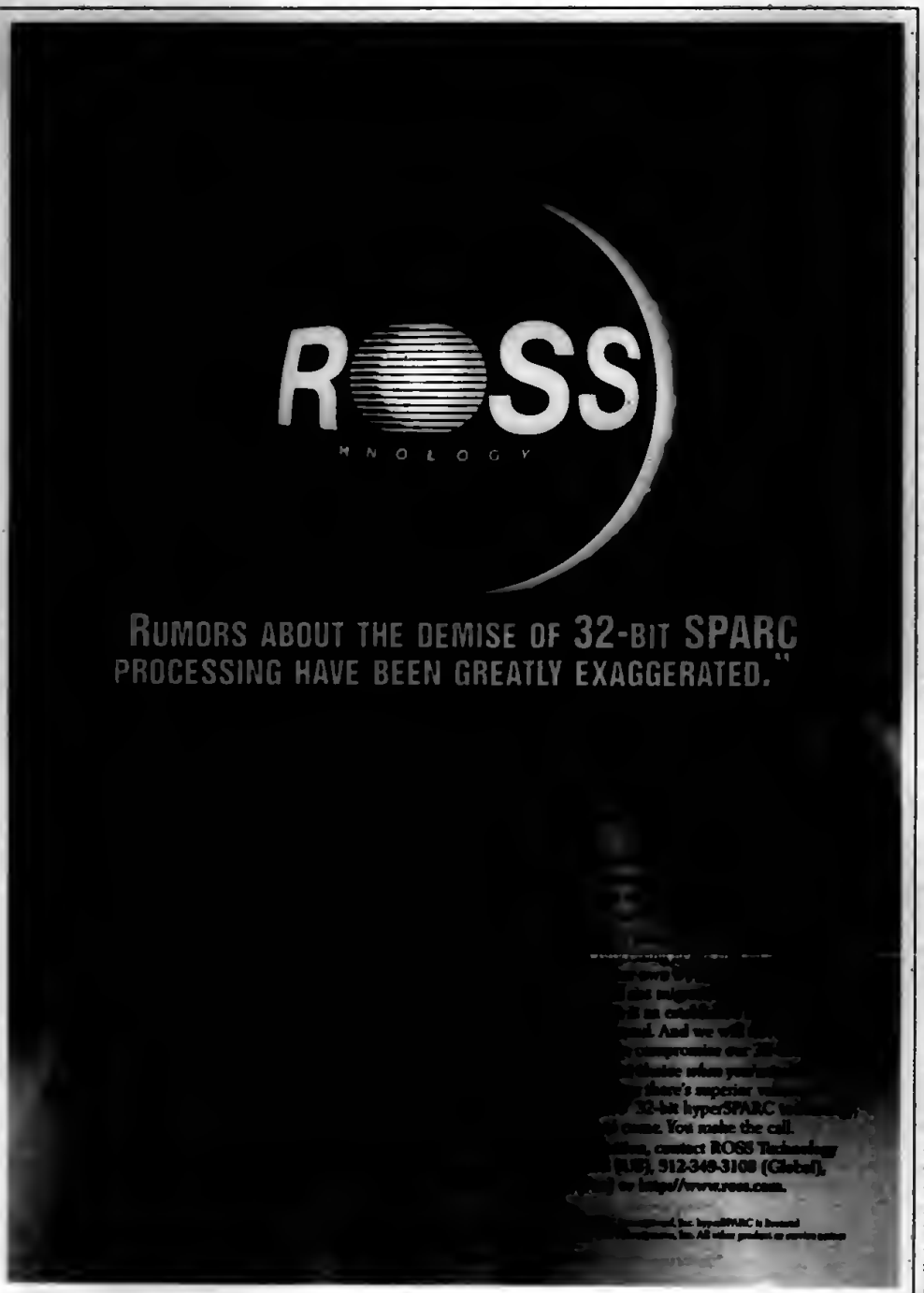
Seagate Enterprise Management Software, Inc. in Cupertino, Calif., will be among the HP partners demonstrating support.

Seagate EMS officials said they will preview Version 2.6 of NerveCenter event-correlation software, which specifically supports Network Node Manager 4.1 and its distributed capabilities. NerveCenter 2.6 is scheduled to ship July 15.

Another sticking point is efficiency because small and overworked management staffs must wrangle with growing networks.

SNMP Research International, Inc. in Knoxville, Tenn., will help OpenView users automate management of far-flung network elements. SNMP Two-Star Security, developed with HP, secures functions of the Simple Network Management Protocol to streamline remote configuration of agents and collection stations.

The Web may serve as a management platform. See page 65.





Micro Focus Challenge 2000 Program

As challenging as it seems, it's a problem that's only going to get more dangerous with time. Today, 20% of business applications cannot handle dates after the turn of the century. By the year 2000 that number will increase to 90%*. Those that aren't converted will fail. The Micro Focus Challenge 2000 Program gives you a comprehensive program of tools and services to fully assess and implement the century date change. Start with the Application Express Offloader™ tool to automatically move the application to a PC. Use Micro Focus' Revolve® Year 2000 analysis tools to inexpensively locate the problem areas. Then, modify the application with Micro Focus COBOL Workbench.® You can even choose to replace your date logic with TransCentury® Calendar Routines. It's quick. It's efficient. It's complete. It's also an effective first step towards reengineering your legacy COBOL applications. After all, fixing a business application should be as quick and painless as possible (right Fido?).

We can train any application to obey the century date change.



See for yourself. Call 1-800-MFCOBOL today for your free Assessment Tool Kit. It provides a complete set of guidelines for structuring your Year 2000 project.



A Better Way Of Programming™ **MICRO FOCUS®**

*Hey don't blame us, we didn't just come up with these numbers. CDC figures are taken from "Three Centuries: Death, Taxes and the Year 2000" by R. Schuck of the Gartner Group. Micro Focus and COBOL Workbench are registered trademarks and "A Better Way of Programming" is a trademark of Micro Focus Ltd. Revolve is a registered trademark of Burl Software. All other trademarks are the property of their respective owners.

Switching back to net manageability

New tools help managers monitor nets

By Patrick Dryden

New tools entering the market can help administrators and troubleshooters shed light on the black holes in their end-to-end network management caused by switches.

Options include application monitoring software to track performance through switched and routed networks, a handheld switch tester and inexpensive monitoring software tuned to specific switches and hubs.

Analysts say each new product is a welcome breakthrough. These unique tools can help users regain the network manageability they traded away in the rush to overhaul campus LANs with switches, they say.

In shared-media networks, managers can watch all the traffic that flows through one section. But ever-cheaper switches let them slice networks into smaller segments, which boosts performance but forsakes visibility.

Track record

"We need to track packets and errors through our Ethernet switches, not just depend on ... the little green lights and little red lights that show basic port activity," said Fran Glasco, MIS director at AZO, Inc. in Memphis. "Bottom line, we just want to see what's eating up bandwidth."

Glasco is considering adding monitor software or holding out for newer switches with support for remote diagnostics.



To check AZO's switched segments, Glasco lugs a laptop to the switch, gets into terminal mode, samples ports one at a time and writes down statistics for analysis.

Switching also clouded the view of network connections at the National Weather Service in Silver Springs, Md.

Users there needed faster access to server-based simulations and exchange of satellite image files. But network managers are "limited on information available through the switches," said computer specialist Jerry Kelly.

Managing switched networks should get less cumbersome with the release of several new tools, including the following:

- Compuware Corp. next week plans to ship Version 2.0 of EcoNet, graphical monitoring software that analyzes the response time of client/server applications.

"There's a very big need for their simplified application traffic analysis in switched networks," said Brian Burba, a management analyst at International Data Corp. in Framingham, Mass.

But Compuware supports only three switches from 3Com Corp. and Cisco Systems, Inc.

- At PC Expo this week, Fluke Corp. will launch the SwitchWizard version of its Enterprise LANMeter, a portable tester for cables and internetworking gear.

The Fluke Networks division in Everett, Wash., offers SwitchWizard for $995 as an option or upgrade to Enterprise LANMeter, which starts at $8,495.

- 3DV Technology, Inc. last week introduced performance monitoring software at one-tenth the price of Remote Monitoring (Rmon) systems that have similar capabilities.

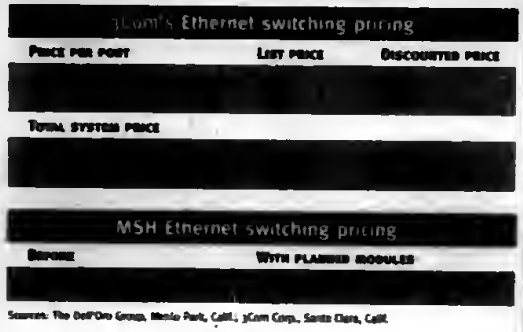
"This specific-vendor reporting approach lets 3DV provide helpful management information right out of the box, compared to Rmon systems that require a lot of work," Burba said.

Web may serve as a management platform. See page 65.

3Com cuts Ethernet switch price

Discounts could hasten deployment of desktop switches

By Bob Wallace



Sources: The Dell'Oro Group, Menlo Park, Calif.; 3Com Corp., Santa Clara, Calif.

3Com Corp. is slashing prices in an effort to tighten its grip on the desktop Ethernet switch market.

The company has quietly given its distribution channels permission to discount its already low-cost LinkSwitch 1000 desktop Ethernet switch by up to 40%, sources said. And the company is prepping inexpensive Ethernet switching modules for its shared-media hub.

Shared-media hubs let many users share the capacity of a regular Ethernet LAN; Ethernet switches provide dedicated bandwidth for every port.

Can't say no

"They're making Ethernet switching irresistible to users with these discounts," said Tam Dell'Oro, president of The Dell'Oro Group, a research and consulting firm in Menlo Park, Calif. "This will accelerate the move from shared-media hubs to Ethernet switching."

Users agreed.

"This effort sounds like a winner to me since we're planning to roll out some high-bandwidth applications such as multimedia to the desktop and need the capacity of switched Ethernet to do it," said Maralyn Rosenblatt, vice president of client services for desktop technologies at Country-wide Insurance in Simi Valley, Calif. "A 40% discount makes it a lot easier for me to justify Ethernet switching to upper management."

Mike Green, director of technology at Williams-Sonoma, Inc. in San Francisco, said he finds the discounts alluring. "This would be the point where we could move from regular Ethernet in our warehouse to Ethernet switching. It makes sense since we have many clients trying to access one server."

3Com wouldn't confirm or deny the deep discounts, which undercut rivals Cisco Systems, Inc., Cabletron Systems, Inc. and Bay Networks, Inc. (see chart).

3Com accounted for 52% of all desktop switched Ethernet ports shipped in the first quarter this year, according to The Dell'Oro Group. Cisco shipped 26% of the ports in that same period.

The 3Com move could trigger a price war, but Dell'Oro said other vendors can't manufacture in the volumes that 3Com has attained, and they don't have 3Com's broad distribution channels.

But not all users can afford to abandon their investment in shared-media hubs yet.

3Com has anticipated that; the company is quietly preparing Ethernet switching modules that can be used in the estimated 8,500 Multi-Service Hub (MSH) shared-media hubs in user networks today. They will enable the hub to support a mix of the two technologies.

The Ethernet switching modules cost less than $300 per port. The vendor previously offered an Ethernet switching module for the MSH, but it cost $1,110 to $1,665 per port. With the new modules, the MSH can be configured to support a maximum of 120 switched Ethernet ports.

3Com is also prepping two Fast Ethernet uplinks for the MSH that will let users link the hub to 100M bit/sec. backbone networks. Modules will ship Aug. 22.

Digital sales revamp speeds channels push

By Jaikumar Vijayan

Digital Equipment Corp. is doubling the number of corporate accounts that it will directly service to roughly 2,000.

The move highlights a new, elaborate — and somewhat confusing — three-tier market delivery plan designed to improve customer service, reduce cost of sales and alleviate channel conflict.

Customer service

Digital's goal is to ease the flow of information between itself and its customers. Users contacted by *Computerworld* last week said it is too early to predict how the reorganization will affect them. But they said they welcomed the move.

Good move

"Moving to the indirect channel is probably a good thing. Third-party folks are ready to beat up each other on sales and service," said Ronald Freed, MIS manager at Hatfield Quality Meats, Inc. in Hatfield, Pa.

Toward this end, Digital last week said it will tie an increased direct presence in its customer base with a substantial boost in the role of its channel partners — such as dealers, value-added resellers and systems integrators [CW, June 10].

Under the three-tier plan detailed by company executives last week, Digital will continue to assign several representatives to each of about 1,000 top-tier accounts that it will directly serve. But some of the accounts currently in this top tier could get replaced by other companies that Digital thinks will yield the most in long-term sales, said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass.

The company also will add a second tier that comprises about 1,000 slightly smaller accounts, each of which now will be covered by a specifically assigned Digital sales representative.

The representatives will generate orders and keep customers informed about the latest product information.

Finally, Digital will soon start a telemarketing effort to keep in direct touch with smaller and mid-size third-tier customers with whom it has had little or no direct contact in the past.

In all cases, Digital will rely heavily on the indirect channel for actual order administration, order fulfillment, service and support.

"All this sounds good. In fact, the biggest change we have noticed over the past few years is not having someone from Digital drop by every two weeks and say, 'Hey, take a look at what's new,'" said Michael Felerski, systems network manager for Butler County, Ohio.

How Forté Became The Fastest Growing Systems Software Company In History

With all the shouting and outrageous claims being made about systems development tools, we thought you might like to cut through the confusion over application development breakthroughs. Simply put, we *really* have one, and our success speaks for itself.

The breakthrough: application partitioning. You develop as if for one machine, and the Forté Application Environment™ seamlessly, automatically and dynamically distributes your application objects across however many servers and for however many clients, irrespective of platform, operating system or RDBMS. Period.

If you need to develop, deploy and manage high-end client/server applications, we invite you to spend half a day at the next Forté seminar. Call 800-90FORTE (800-903-6783). Or reserve your seat via the Web.

FORTÉ

http://www.forte.com

©1996 Forté Software, Inc. Forté, the Forté Application Environment and the Forté logo are trademarks of Forté Software, Inc. From outside the US call 510-869-3400

TRBA

Notebooks lead tech parade at PC show

By Mindy Blodgett

Top notebook vendors will showcase new releases at this week's PC Expo in New York to give rising sales another shot in the arm.

According to International Data Corp. in Framingham, Mass., U.S. laptop shipments for the first quarter rose from 801,000 last year to 975,000 this year.

PC Expo

And analysts predict worldwide sales will grow 28% this year.

Market leader **Toshiba America Information Systems, Inc.** in Irvine, Calif., this week will announce several new notebooks.

These include the Satellite Pro 420 series, multimedia notebooks with 100-MHz processors that will start at $2,999, and an update to the Portege 650CT. The Portege 650CT weighs 4.8 pounds, has a 133-MHz chip and an 11.3-in. screen. It costs $4,499.

Texas Instruments, Inc. in Dallas will release a high-end notebook in the TravelMate 6000 series. The notebooks will have 120- and 133-MHz chips and 11.3- and 12.1-in. screens. Pricing will start at $4,199.

Olivetti Personal Computers USA, Inc. in Austin, Texas, this week enters the U.S. market with the Echos family.

The notebooks will have 100- and 133-MHz chips and screen sizes that range from 10.4 to 11.8 inches. They will cost between $2,499 and $4,999.

Indie releases

There are also some developments this week from the leading operating system vendors.

IBM, which is slated to ship its next release of OS/2 Warp — code-named Merlin — late this summer, will showcase the product. IBM also plans to announce new clustering capabilities for its OS/2 Warp Server network operating system.



Features of the Toshiba Portege 650CT

- **Processor:** 133-MHz Pentium
- **Memory:** 16M bytes, expandable to 80M bytes
- **Screen:** 11.3-in. active-matrix color
- **Bus architecture:** PCI system supporting external docking

Meanwhile, independent software developers for **Novell, Inc.**, including **Systron, Inc.**, will demonstrate the next release of NetWare 4.x — known internally as Green River.

Novell is working feverishly to put the finishing touches on Green River so the product can ship late this summer, which is about the same time Windows NT 4.0 is due to hit the streets, sources close to Novell told *Computerworld*.

New Pentium Pro-powered servers will be on display, some of which were recently announced and some that are previews of upcoming announcements.

AST Research, Inc. in Irvine, Calif., will ask attendees to try the firm's new Manhattan dual-processor Pentium Pro servers. Pricing will start at $7,500.

Dell Computer Corp. in Austin, Texas, will preview its new single-, dual- and quad-processor Pentium Pro servers that the firm plans to ship by year's end.

Several vendors will demonstrate network computing devices designed to attach directly to the Internet. Those vendors will include AST Research, **Wyse Technology, Inc.** in San Jose, Calif., and **JCC Corp.** in Japan.

Comdisco, Inc. will present a desktop asset management survey by **Survey Research Group**, which will reveal the average company savings by employing asset management on the average $60,000 cost of a networked PC over five years.

See *Computerworld*'s Web site for updates this week at www.computerworld.com.

Senior editors Laura DiDio, Kim Nash and Bob Francis contributed to this story.

Oracle sends a group message

By Tim Ouellette

This week, Oracle Corp. will become the latest vendor to dive in to the groupware pool when it unveils Oracle InterOffice, groupware based on the Oracle7 relational database.

And in a twist on the groupware theme, the Redwood Shores, Calif., firm also appears to be laying tracks to turn InterOffice into a full collaboration suite by adding word processing, spreadsheet, presentation graphics and electronic forms components into future versions of the product.

Analysts said the integration of productivity components into InterOffice is similar to the strategy behind Lotus Development Corp.'s Lotus Components for Notes. The focus is to provide a basic feature subset of traditional suite applications so users can embed an editable spreadsheet within a Notes document, for example, without launching a separate application.

Prompting change

It isn't clear whether Oracle will add links to existing full-featured productivity applications or develop its own smaller components.

With InterOffice's built-in support for client access from almost any platform, including Web browsers, analysts say Oracle's initial splash could be a tidal wave that crashes on other players in the groupware market.

	InterOffice	Notes
Application development	OCX controls expose various groupware services	Built-in LotusScript and extensions for Notes development
Client	Web browsers and standards-based client support	New Domino Notes server will allow access from Web browsers
Back end	Oracle7 database	Notes databases
User base	500,000 Oracle Office users	5 million users

Lotus Development Corp., Microsoft Corp. and Novell, Inc. plan to open up their groupware products in a similar manner.

Oracle must overcome its late start, lack of reputation for delivering nondatabase products and a perception among non-Oracle users that the firm is just trying to sell more database licenses.

For example, even an Oracle database user, the IRS (see story, page 4), isn't convinced of Oracle as a groupware option to other Internet alternatives. "No, I wouldn't buy it — it's too late," said Thomas Bridges, a network manager at the IRS in Austin, Texas. "Oracle is not something you put on the desktop. They are best used in the glasshouse."

But one user of Oracle's low-end workgroup effort — Oracle Office — is positive. Detroit Edison expects to benefit from the workgroup and Internet features available in InterOffice, said Donald Brett, chief information officer at the electric utility.

The firm's 5,000 users now run Office as their only electronic-mail system. "Had they not done this, we would have found ourselves in increasingly difficult times [with Office]," he said, referring to pressure to add better collaboration to the system.

In InterOffice, Oracle added collaboration capabilities, document management and a workflow component (due by year's end) to Office's group E-mail and scheduling features.

Users say Symantec has gotten its Act 3.0 together

By Stewart Deck

When Symantec Corp. unveils the new version of its top-selling contact management software — Act 3.0 for Windows 95 — later this summer, users will discover several long-awaited features.

One of the new features will let users work in their preferred word processor and merge letters and documents directly into Act 3.0. Louise Reilly Sacco, a marketing consultant in Needham, Mass., applauded the move. "This will save me [from] exporting individual files for mail merges. I like the sound of that a lot."

'Meaningful changes'

Analysts said it was a good move for Cupertino, Calif.-based Symantec to bypass Act 3.0's built-in word processor, described by some as only "functionally adequate."

Pricing for Act 3.0 is expected to remain close to the current price of $199, a company spokesperson said.

Act 3.0 splits the difference between a major revamp and modest product tweaking, said George Colombo, publisher of "Sales Automation Adviser," a newsletter in Winter Springs, Fla. "It's still the product that's easy for beginners to start using, but it has some meaningful changes."

The release spices up the report generator by adding subtotal results, statistics functions and sorting capabilities. Sacco said this will help her integrate reports and figures from disparate sources and save her the time of transporting them to other applications.

Act now

With new features of Symantec's Act 3.0, users will be able to do the following:

- Attach files to contacts
- Customize layouts and databases
- Find contacts based on Caller ID with telephony application programming interface support
- Share group calendars
- Manage projects and accounts

Even with the new bells and whistles, Sacco said she will still have to wait for Symantec to include in Act the tool that is at the top of her wish list — one that lets her combine data from different databases into a central scheduler. "I keep hoping they'll give me something so I don't have to go into each of my separate calendars to see what I have to do that day."

Claris buys open Web authoring tool

Product will merge into Home Page, run on Mac, Win 95 and Win NT boxes

By Lisa Picarille

Apple Computer, Inc.'s software arm now has Internet legs.

Apple subsidiary Claris Corp. last week entered the heated World Wide Web authoring race by purchasing a cross-platform Web page creation tool for an undisclosed sum from privately held San Andreas Systems in Los Altos, Calif.

The package, code-named Loma Prieta, will be transformed into Claris Home Page as part of Apple's plan to shift its focus to Internet products.

Claris Home Page, which runs on Mac OS, Windows 95 and Windows NT, targets individual users and webmasters.

A beta version of Claris Home Page is due later this month as a free download from Claris' Web site (www.claris.com).

Web authoring rivals

Program	Price
Claris Home Page	To be determined
Microsoft FrontPage 1.1	$149
Adobe PageMill 1.0	$99
DataPoint QuickSite	$99.95
SoftQuad HotMetal Pro 2.0	$195

The final version is slated to ship — on Windows and Mac OS — by the end of the summer. Pricing has yet to be determined.

Observers said Claris Home Page's availability on multiple platforms gives it broader appeal. Microsoft Corp.'s rival FrontPage is a Windows-only package. Adobe Systems, Inc.'s PageMill is available on the Macintosh, and a Windows version is in the works.

Switch-hitters

Claris in Santa Clara, Calif., plans to exploit that edge by making "competitive sidegrade" offers to entice users to switch to Claris Home Page.

Daniel Dern, an independent Internet consultant in Newton, Mass., said users who create Web pages are "highly likely to switch products or even use multiple products for Web page creation." That's because Hypertext Markup Language (HTML) is a standard for creating Web pages, and the only user investment is the cost of the software.

One user said his organization uses PageMill to create Web pages but added that he was receptive to new products.

"I suspect it will be easy to switch from other competing products. And the availability of new features, especially if they cost less, encourages us to check out new products," said Victor Nazarian, computer systems director at Harbour Inn Medical, a hospital in Baltimore.

Beyond the basic Web page authoring features of rival products, Claris Home Page lets users view and edit HTML code, generate complex tables and frames, run Java applets and drag and drop prebuilt Web design items.

Claris also plans to beef up the integration among Claris Home Page and the company's popular ClarisWorks and FileMaker products, which have an estimated 10 million users.

The proposed integration would add an HTML module to ClarisWorks that would allow ClarisWorks files to be read directly into Claris Home Page.

Information Builders' Cactus grows Web pages. See page 50.

ON SEPTEMBER 16TH, AUDIENCES EVERYWHERE WILL BE AMAZED.

IBM to offer DB2 text extender

By Dan Richman

Within less than a month, some users of IBM's DB2 database system will be able to manipulate text, video, audio and images.

IBM officials said they will package four "extenders" to DB2 in the Developers' Connection Cross-Platform Development Kit, which is set to ship by July 14. It will cost $495.

Extenders are IBM's term for software add-ons that expand the types of data DB2 can add, query, sort and otherwise manipulate.

The extenders will work with Version 2.0 of DB2 for AIX, OS/2 and Windows NT. A text extender for AIX has been shipping since January. Plans call for extenders to be created for all DB2 platforms, but no timetable has been disclosed, said Janet Perna, IBM's director of database technology.

One early user of the text extender to DB2 is Kathy Mesa, a publishing systems analyst at the *San Jose Mercury News* in San Jose, Calif. The paper uses a beta version of the software that lets users search through a database of classified ads on a World Wide Web site run by the paper and eight others. "Users say we have the best career-search service in the 'net, in large part because of our speed," she said.

IBM's scheme for dealing with these nontraditional data types, Perna said, is to provide an application programming interface for text, video, audio and images as well as for traditional data such as characters and numerals. That allows a single SQL statement within a database application to manipulate both types of data.

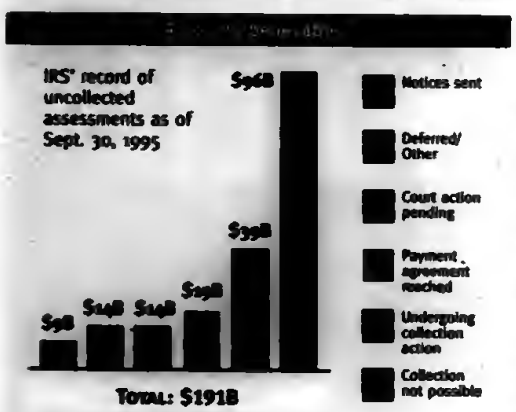
IRS can't account for billions

CONTINUED FROM COVER 1

posed to be collecting or spending has simply disappeared."

But at least one senator sounded a call for financial oversight of the organization, which has perpetually been in hot water with Congress, most recently over difficulties in modernizing its tax systems [CW, April 1].

Sen. Ted Stevens (R-Alaska), chairman of the Senate Governmental Affairs Committee, said the IRS may require an "outside entity" to lead it out of its system woes. He cited as a model the financial control board now riding herd on the District of Columbia.



Problem areas

Gregory M. Holloway, director of government audits at the GAO, told the committee the GAO wasn't able to determine the reliability of the IRS' financial records. He ticked off the following compelling problem areas:

- 1994 revenue of $1.3 trillion, as recorded in the IRS' detailed taxpayer files, was $10.4 billion less than what was recorded in the aggregate tax revenue figures maintained by the U.S. Department of the Treasury.
- "The IRS did not know, and we could not determine, if the reported amounts were correct," Holloway said.
- The IRS accepts a tax return as an official record of taxpayer income when the return is filed. At the end of each year, the IRS begins matching those returns with taxpayers' earnings as reported by the Social Security Administration, a process that can take 2½ years. The delay adversely affects the IRS' ability to account for and collect delinquent taxes.
- GAO auditors said they couldn't "verify the validity" of $113 billion in total accounts receivable and $46 billion in collectible receivables in the IRS' 1995 books.
- The IRS last year hired a contractor to reconcile the differences between IRS and Treasury records back to 1992. Documentation on those differences before 1993 couldn't be located, and $10 million was written off as a result.

"These systems do not meet today's accounting standards for financial management systems, and they do not provide an adequate transaction trail," said Valerie Lau, inspector general at the Treasury Department, in testimony before the committee.

In response to the litany of complaints, Musick outlined a series of measures, begun last year, to ensure more detailed tracking and reporting of revenue transactions. Such tracking wasn't required of federal agencies before passage of the Chief Financial Officers Act of 1990, he said.

Musick said the IRS has strengthened the documentation of revenue transaction flows, greatly increased the retention period for detailed records, integrated many administrative systems, replaced some paper flows with electronic communications and made other system improvements.

A report issued by the GAO earlier this month confirmed the IRS has taken many steps to improve its $8 billion tax systems modernization program. "However, many of these actions are still incomplete and do not respond fully to any of our recommendations," said Gene L. Dodaro, assistant comptroller general.

At an IRS oversight hearing in March, Rep. Jim Lightfoot (R-Iowa) threatened to pull the plug on the beleaguered program if the agency couldn't prove to him within two months that it was on the right track [CW, April 1].

A spokeswoman for Lightfoot, who is chairman of the House Subcommittee on Treasury, Postal Service and General Government, last week said the congressman had received a "progress report" from the IRS but "serious concerns remain."

The subcommittee will meet this week to work on funding legislation for the IRS, the spokeswoman said.

SAP unlinks R/3 apps

CONTINUED FROM COVER 1

simultaneously update financials, human resources and logistics applications," said Hasso Plattner, vice chairman of SAP. Instead, users will be able to upgrade an individual package, such as financials, "without bothering the others," he said.

But the trade-off could be as much as a 20% decrease in the enterprisewide efficiencies that R/3's current application-to-application integration now offers, according to Peter Zencke, a member of SAP's executive board.

The individual applications, which run on separate databases, will be linked via SAP's application link enabling (ALE) messaging technology.

"We can still achieve good integration, but not 100% integration," Zencke said.

Pricing for the separate products will equal pricing for the integrated modules. That is about $4,000 per user for the SAP financials module, for example.

ALE also is at the heart of R/3 3.1, which features 25 new R/3 Internet applications and a Java-based graphical user interface. R/3 3.1 will be delivered to all R/3 3.0 users as a regular upgrade by year's end.

Each of SAP's new Internet programs — known as satellite applications — run on Windows NT-based servers separate from a user's core R/3 system.

Saving a bundle

Providing Internet access to R/3 will save millions of dollars annually at Sasol Ltd., a $4 billion petrochemical company in Senderwood, South Africa. Sasol now leases bandwidth from a third-party vendor to furnish its 24 business units worldwide with a dedicated network.

"The dedicated lines cost a fortune," said Dirk Struwig, manager of intercompany information services at Sasol.

Struwig said Internet access to R/3-based shipping information would allow Sasol to better manage and track a complex distribution process. This involves shipping goods by both pipeline and tanker to offshore storage facilities before distributing them to their final destinations.

SAP's R 3 Version 3.1 includes:

- 25 new SAP R/3 Internet programs
- SAPGUI, a new R/3 user interface based on Java
- A repository of 100-plus R/3 APIs for use by third-party developers
- R/3 Internet Transaction Server based on Windows NT

SAP's offerings will include supply chain transactions, such as ordering goods, and intranet transactions, such as enabling employees to look up benefits information.

Virtually all enterprise vendors have announced Internet access to their software. But SAP "has gone further than anybody else in figuring out specific transactions," said Andrew Dailey, an analyst at Gartner Group, Inc. in Surrey, England.

Plattner said SAP will develop different pricing schemes for different types of users. Occasional R/3 users, such as managers, will pay less than full-time users. How SAP will track the number of users who access R/3 through the Internet hasn't been decided.

"If we cannot count [Internet] users, we will count transactions," Plattner said. "The price of R/3 on the Internet is not for free."

Coming soon: R/3 on AS/400

IBM and SAP AG are replicating the one-stop shopping setup in the new customer at small and midsize companies.

Beginning next month, the two vendors will deliver SAP's integrated R/3 software preloaded on IBM's AS/400 [illegible] share up-to-[illegible] enterprise R/3 [illegible]. This is the first time IBM has preloaded [illegible] on any platform.

The vendors also will give users joint hardware and software support. "Customers will still have to service operations, one with IBM and one with SAP," said Hermann Schaper, an SAP official at Walldorf, Germany. But users will pay roughly the same [illegible] running [illegible] on other R/3 platforms. Currently, it costs about $1,000 per user for SAP [illegible]. —*John King*

DECISIONS ARE TOUGHER.
TIME IS **CRITICAL.**
RESOURCES ARE LEANER.
AND THE BUCK STOPS WITH **YOU.**

...HYPE JUST WON'T CUT IT ANYMORE.

CFO Vision

THE **POWER** T
FIGURE IT OU



Stop crunching and start analyzing. With CFO Vision you can visualize your business interactively...and gain control of information to spot opportunities and risks faster than ever before. Reengineer the entire process of *financial consolidation, reporting, and analysis*...as you accelerate the flow of information to decision makers at every level of your organization.

With the click of a mouse:

- Understand the facts beyond the figures.
- Improve timeliness and availability of business reporting.
- Analyze every "slice" of your business—from branch profitability to product cost analysis—in any currency.

Powerful, award-winning data warehousing, OLAP, graphics, and EIS capabilities are all included in one fully integrated, easy-to-use solution. It's all yours from one vendor: SAS Institute, with a proven track record for continuous innovation and reliable support at more than 29,000 organizations worldwide...including the *Fortune 100*.

For a free preview of CFO Vision, just give us a call or send us E-mail at cw@sas.sas.com



919.677.8200 Fax 919.677.4444 In Canada 1.800.363.8397 www.sas.com/vision/

SAS.

SAS is a registered trademark, and CFO Vision a trademark, of SAS Institute Inc.
Copyright © 1996 by SAS Institute Inc.

You see a horse race. We see two thoroughbreds.



Microsoft





A lot of other companies do, too. They're [illegible] Windows 95 and the [illegible] Workstation [illegible]. Why? Because they want to realize the benefits of a [illegible] manageable operating system. They also want to run the latest versions of their applications and take advantage of [illegible] Internet technologies. That's why seven-out of ten organizations* have deployed (or are planning to deploy) Windows 95 and/or Windows NT Workstation. They know that both are safe bets.

The reason we developed both operating systems is twofold: first, to achieve maximum compatibility with our [illegible] existing hardware and software, and second, to provide them with [illegible] even more reliable and secure operating system. Today, customers can run most of the same applications across both Windows 95 and Windows NT Workstation. And [illegible] with the release of Windows NT Workstation 4.0, both products will share the same user interface.

What's the right mix for your organization? That depends [illegible] what you need. Windows 95 is the easiest way to migrate to 32-bit Windows. It not only supports a third more hardware devices than Windows NT Workstation, it also has lower system requirements. Windows 95 also offers greater compatibility with certain MS-DOS® applications. What's more, it has two functions that Windows NT Workstation, for the time being, does not: Plug-and-Play, and Power Management for mobile users. Windows NT Workstation, on the other hand, offers greater reliability and security, thanks to its advanced microkernel architecture. It's simply one of the most powerful and robust 32-bit desktop operating systems you can get.

So if you thought you needed to hedge your bets, you don't, because this is no horse race. In fact, we will continue to support and update each product in the future since our customers continue to want both the broad compatibility of Windows 95 and the power of Windows NT Workstation.

For more help determining the best mix for your company, visit www.microsoft.com/windows/mix2/

© 1996 Microsoft Corporation. All rights reserved. Microsoft, Windows, and Windows NT are registered trademarks and Where do you want to go today? is a trademark of Microsoft Corporation. *According to PC Data, April 1996 Retail Report, seven of the top 10-selling business application copies Windows 95 or Windows NT. **According to a survey of over 500 North American companies with 50 or more employees, conducted by IDC International, Inc., March 1996.

Vendors ready groupware barrage

Novell, Lotus, Oracle and Microsoft engage in the battle of the beta tests

By Tim Ouellette

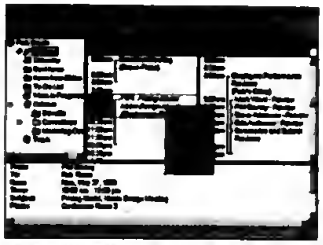
Groupware vendors are beta-testing a slew of products this summer, promising users a number of new options by early fall.

The most significant move was Novell, Inc.'s release two weeks ago of the full-featured beta version of GroupWise 5.0, the upgrade to GroupWise 4.x installatioos.

Lotus Development Corp. is beta-testing Domino, its combined Notes/World Wide Web server [CW, June 3], and Oracle Corp. has been testing InterOffice, a groupware suite based on the Oracle7 database, which ships this week.

For its part, Microsoft Corp. is following the successful beta program of its Exchange Server with a small test of its free, low-end Internet Mail client software.

With GroupWise 5.0, Orem, Utah-based Novell is playing catch-up to groupware releases this year from Lotus (Notes 4.0) and Microsoft (Exchange).



Novell GroupWise 5.0 *beta testers said the multitude of features in the Universal Mailbox makes it stand out from the crowd*

But early beta users and analysts said the easy access to a busload of informatioo — including appointmeots, workflow tasks, contacts, documeots and electronic mail messages — in GroupWise's Universal Mailbox differentiates it from Notes and Exchange.

Easy administration

For other users, better administration is the meat and potatoes.

"We've noticed the biggest improvement is in the administratioo utilities through NWAdmin, [the NetWare network administration utility]," said Ken Ainge, a GroupWise beta tester at KTVX, a television station in Salt Lake City.

Users will be able to manage GroupWise 5.0 from within their NetWare management screen, and non-NetWare shops will be required to run one NetWare server for administration. This won't affect the performance of GroupWise 5.0 on other server platforms, Novell officials said.

GroupWise 5.0 initially will be available for NetWare and Windows NT servers, with Unix and OS/2 server support expected later this year. GroupWise 5.0 is still slated to ship in late summer, with one additional beta release scheduled to improve overall performance of the software, the officials added.

Notes meets the Web

With Domino, Lotus makes good on a promise it made in December to have Notes work hand-in-hand with Web technology. Domino offers native Hypertext Transport Protocol support inside a Notes server.

Both Notes clients and Web browsers will be able to access Notes applications and documents. Domino can store Hypertext Markup Language (HTML) documents and will translate Notes documents to HTML format.

"It's definitely something we could use for an intranet," said Jeffrey Harris, a Domino beta tester and senior network engineer at Integrated Data Systems in Chantilly, Va.



Everything you'd expect from a server running AIX.



Lock some or all of it up with a three-position, three-level security locking door

An LCD display gives you a heads up on the server even when you're running it headless

Fast Two built in Fast/Wide SCSI-2 channels deliver internal data transfer speeds all the way up to 40MB per second.

Faster The internal PCI bus moves bytes around at a quicker 132MB per second.

Fastest As in 256MB per second. That's the speed you'll get out of the processor-to-second-level cache

Apple Network Servers don't run any old UNIX® operating system They run IBM's reliable, industrial strength AIX® operating system

Hot feature Two rear cooling fans are hot-swappable

With support for both TCP/IP and AppleTalk® protocols, you get fast network speed when you have either PCs or Macintosh® systems (or both) connected. Of course, being Apple, we couldn't resist tuning AppleTalk for maximum speed

Add a PCI RAID disk array card, and your Network Server supports up to six hot-swappable drive bays. So your server doesn't have to go down just because one of your drives does.

With a modular processor daughtercard, upgrading the microprocessor in your Network Server is a snap

Each major component of the Network Server 700 can be accessed in about the time it takes to read just a few of these captions—60 seconds or less

Add up to six PCI cards—Ethernet, FastEthernet, PCI RAID disk array (only four of these, sorry), or a wide array of third-party PCI cards—in the six (count them, six) open slots.

Choose from two models, the Network Server 500 and the Network Server 700. As you'd expect, the Network Server 700 offers more speed and expandability

Losing a power supply doesn't have to mean losing power Twenty seconds is all it takes to replace either one of the two optional hot-swappable, redundant power supplies you get with the Network Server 700.

Not that we're saying you'll ever need it, but an optional, 7-day-a-week, 24-hour-a-day service plan is available To learn about priority queuing, next-day on-site service and more, simply contact your Apple Premium Server Reseller

You can easily add third-party memory DIMMs, SCSI disk drives and tape drives to our Network Servers We won't, however, refuse your hard-earned money if you prefer genuine Apple® components.

You want your server just to sit there and work But that doesn't mean it has to be ugly Enter Apple industrial and ergonomic design It means our servers don't just look good, they're easy to move, upgrade and service, too

Vocabulary test Apple Network Servers are binary-compatible with >10[3] proven AIX apps, no recompiling or porting necessary

You get free* "try before you buy" software, too Helios and IPT software for OPI publishing and file and print sharing, Legato Networker software for backup and recovery, and APC software for uninterruptible power supply support.

Is there any such thing as too much disk space? A great way to find out is to plug in a MegaDrive Systems' RAID array with its-whopping one terabyte of storage.

With a rated WebStone 1.1 benchmark performance of 12 megabits per second, the Apple Network Server 700 makes any other server look like a benchwarmer* That's enough raw power to support eight T1 lines and millions of Internet connections a day.

Yes, there's a third, built-in, external SCSI port, perfect for adding up to seven more devices. Like the 20GB Digital Linear Tape (DLT) Drive from Quantum.

Start building the Network Server you need for under $11,000.**

The mouse drawn 10 mA. Pop quiz to follow

Should it ever be necessary, replacing the logic board is as simple as unplugging the old one and plugging in the new

Apple Premium Server Reseller

Even more information is available! Call 800-503-3855 to receive a list of Apple Premium Server Resellers plus detailed product information by fax, or surf your way on over to www.solutions.apple.com/neterver

Except this.

*WebStone is a freely available tool used to test the performance of HTTP servers. It is available on the web at http://www.sgi.com/Products/WebFORCE/WebStone/ **Please note, sorry, but your local Apple Premium Server Reseller for information. ©1996 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, AppleTalk and Macintosh are registered trademarks of Apple Computer, Inc. AIX is a trademark of International Business Machines Corporation, registered in the United States and other countries, and is being used under license. UNIX is a registered trademark of Novell, Inc., in the United States and other countries, licensed exclusively through X/Open Company, Ltd. All Macintosh computers are designed to be accessible to individuals with disability. To learn more (U.S. only) call 800-600-7808 or TTY 800-755-0601



FREE for a Limited Time...A CD ROM Preview of

The Top New Data Warehousing Software

When 200,000 IS managers were asked to choose the top software for data warehousing, their answer had a familiar ring:

SAS software from SAS Institute.

DATAMATION PRODUCT OF THE YEAR

As the only end-to-end solution for rapid data warehousing, SAS software delivers everything you need to manage, organize, and exploit your business data. The tools you use to build a data warehouse are the same ones used to maintain it...run it...and change it. And what's more, everything's scalable. You can jump right into enterprise-wide information delivery applications...or start small and build on your success.

SAS software doesn't consume overhead for database features you don't need. And once you have data in the warehouse, you'll find everything you need for data query and reporting, OLAP/multi-dimensional analysis, data mining, database marketing, data visualization, and much more. It's never been easier to access your data... or to arrive at informed decisions by turning raw data into real information.



SAS® **SAS Institute**

Software for Successful Decision Making

Phone 919.677.8200 Fax 919.677.4444
In Canada 1.800.363.8397

You can also request your free CD ROM, and learn more about SAS seminars in your area, by visiting us on the World Wide Web at http://www.sas.com/

E-mail: cw . sas.sas.com

SAS is a registered trademark of SAS Institute Inc. Copyright © 1996 by SAS Institute Inc.

CA, DEC offer improved management for OpenVMS

By Jaikumar Vijayan

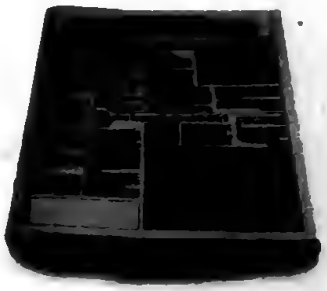
Computer Associates International, Inc. and Digital Equipment Corp. recently announced a broad strategy to allow OpenVMS users to manage their platforms from a Windows NT or Unix environment.

Under the plan, CA will enhance and integrate a range of Polycenter systems management products — recently acquired from Digital — with its CA-Unicenter The Next Generation enterprise management platform [CW, April 29]. Both Maynard, Mass.-based Digital and CA, based in Islandia, N.Y., will sell and support these products when they become available by year's end.

"The good news is that if you are a DEC user currently using these Polycenter products, you don't have to worry about them suddenly going away," said Terry Shannon, editor of "Shannon Knows DEC," a newsletter in Ashland, Mass.

CA's road map comes just days after the company detailed an alliance with Digital. Announced in April, the alliance specified CA's acquisition of 11 of the just over 30 Digital Polycenter products.





Road map for Polycenter

[redacted]

Announced at the Digital Equipment Computer Users Society show in St. Louis two weeks ago, CA's merged product will be called Unicenter for OpenVMS, according to Yogesh Gupta, a senior vice president at the company. Pricing wasn't available.

In the next two months, CA will provide native support for DECnet on Unicenter, allowing Digital users to manage OpenVMS, Digital Unix and Windows NT platforms as a single management infrastructure.

CA will also introduce by year's end new Windows NT and Hypertext Markup Language (HTML)-based management workstations for individual Polycenter point products and upgrade each of them to the latest versions of OpenVMS.

"It is going to be a unified enterprise management environment where [OpenVMS] users can manage all their resources from a single interface," Gupta said.

It's got potential

Some users welcomed the move.

"The integration sounds like a potentially very useful thing for users, particularly in distributed and heterogeneous environments," said Brian Cutler, VMS system manager at the State University of New York at Albany.

Polycenter users should benefit in the long run because of the more concentrated and specific focus that CA has in the systems management area compared with Digital, said Douglas McPherson, a principal network engineer at Innovative Telecom Corp. in Nashua, N.H.

IT'S NOT HOW MUCH YOU READ.

You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld*.

As the only weekly newspaper for IS professionals, *Computerworld* is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all — PCs, workstations, mainframes, client/server computing, networking, communications, open systems, languages, industry news, and more.

It's everything you need to know to get an edge on the competition.

That's why over 145,000 IS professionals pay to subscribe to *Computerworld*. Shouldn't you?

IT'S WHAT YOU READ.

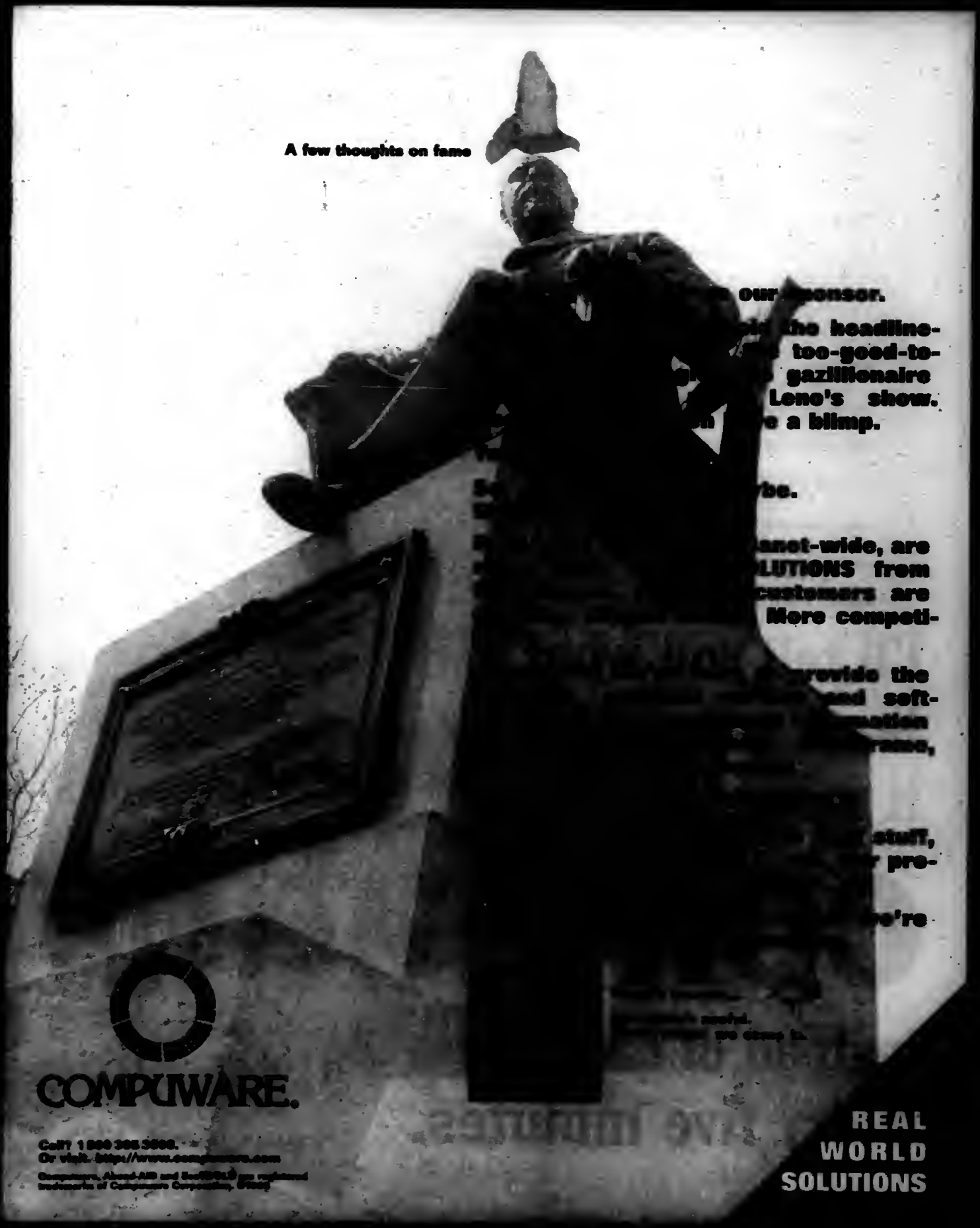
Order *Computerworld* and you'll receive 51 information-packed issues. Plus, you'll receive our special bonus publication, *The Premier 100*, an annual profile of the leading companies using information systems technology.

Call us toll-free at 1-800-343-6474, or visit us on the World Wide Web at http://www.computerworld.com. To order by mail, use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld*.

Then you can spend less time reading about the world of information systems. And more time conquering it.

COMPUTERWORLD
Everything you need to know.

CONNECTICUT CAREERS
WILL BE FEATURED IN COMPUTERWORLD'S JUNE 24 EDITION
DEADLINE: JUNE 20, 3PM


A few thoughts on fame
COMPUWARE.
REAL
WORLD
SOLUTIONS

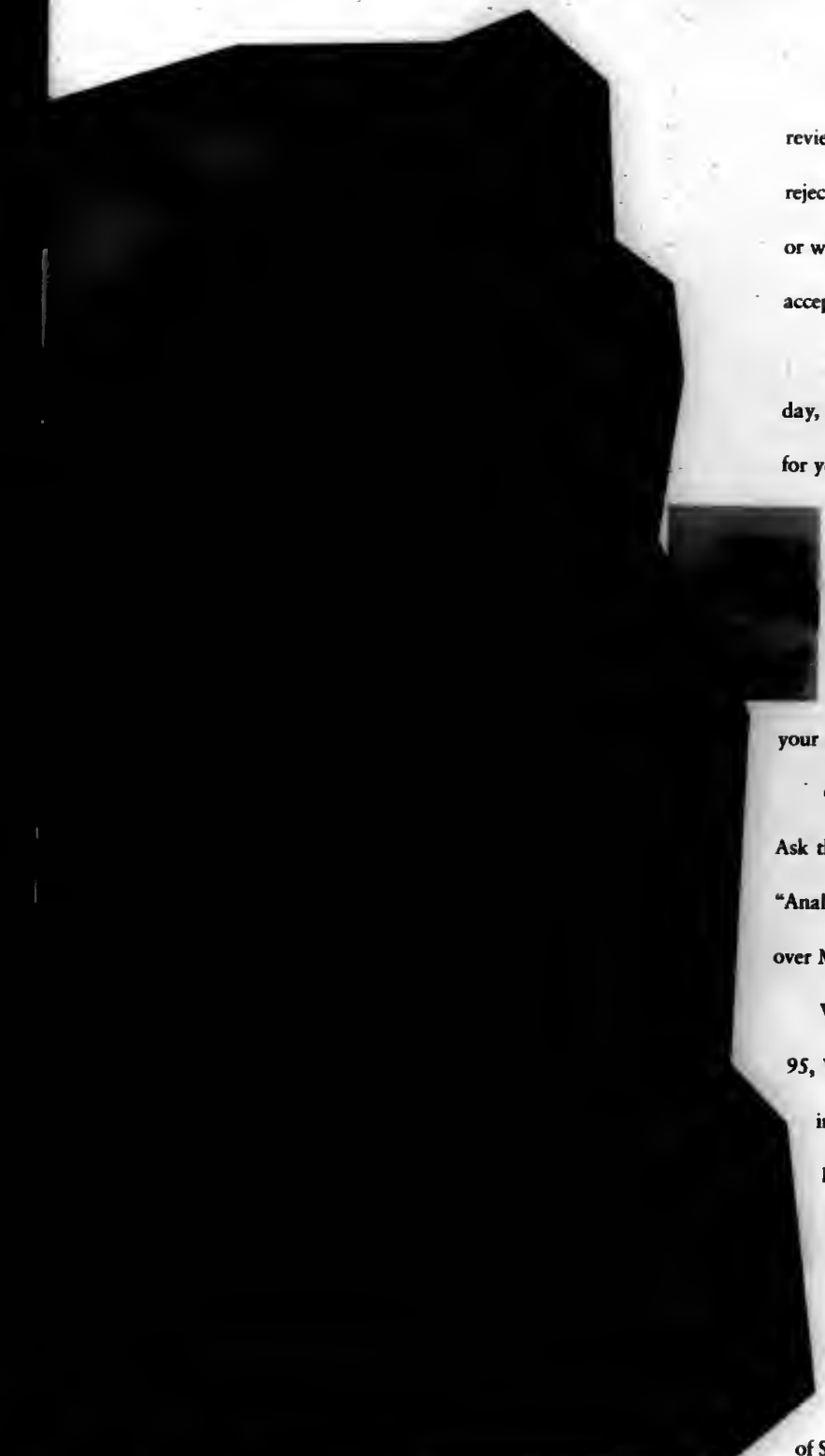
You were hired to do a job. And chances are, baby-sitting the MIS hotline all day wasn't it.

Enter Lotus SmartSuite®. A completely new approach in desktop software – one that promises to keep your users productively engaged in the unique concept of team computing.

TeamReview™ lets users easily solicit feedback by establishing "who" receives a document for review, "what" level of editing rights they'll receive (comment only, read only, or edit only), and "how" the document will be distributed (via floppy disk, e-mail, or Lotus Notes®). Co-workers can then edit using review and comment tools like a highlighter pen, revision marking, or electronic comment notes.

I'll tell you what team computing m
It means the team
comp
instead of calling me every five minutes.





Then, with TeamConsolidate,™ the author can review everyone's edits on one screen and accept or reject the input they've received by the paragraph, line or word. It only takes one click of a button to collapse accepted comments into one revised document.

With SmartSuite's electronic team features, everyday, mundane tasks disappear, leaving more time for your users to do what they do best (besides calling you, of course).

And now with LotusScript,™ the BASIC-compatible scripting language, you can easily customize your SmartSuite applications to get your users working even better together.

Obviously, this isn't ordinary office suite software. Ask the folks at PC Week magazine. They gave it the "Analyst's Choice" award for best Windows® 95 suite over Microsoft Office.®

Versions of SmartSuite are available for Windows 95, Windows 3.1 and OS/2,® and SmartSuite is now included with Aptiva,® ThinkPad® and most IBM® PCs as well as with Select Acer,® AST® and Epson® PCs. Quick, before the hotline rings again, call 1-800-TRADE-UP, ext. B880 today, and order the brand new Lotus Gallery CD. It's free and it comes complete with a 45 day trial version of SmartSuite. Or visit us on the World Wide Web at www.lotus.com.

Lotus
Working Together®

In Canada call 1-800-GO-LOTUS.
©1996 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142.
All rights reserved. Lotus, Working Together, Lotus SmartSuite, Approach, Freelance Graphics, 1-2-3 and Lotus Organizer are registered trademarks and Word Pro, TeamReview, TeamConsolidate and LotusScript are trademarks of Lotus Development Corporation. Windows is a registered trademark of Microsoft Corp., and IBM, OS/2, Aptiva and ThinkPad are registered trademarks of International Business Machines Corp. All other products are registered under their respective companies.



Instant intranet. Just add Netra.



First it was the Internet, now it's the intranet. And everyone wants it built yesterday. You could try to throw together a bunch of hardware and software into a stopgap solution, or you could just unpack a Netra™–the servers built specifically for the intranet. Pre-configured with Core 3.0 software to take advantage of the best Internet technology, Netra servers are the ideal foundation on which to run all your critical business applications. They outperform the competition and give you power to spare on even the most demanding sites. Solstice™ FireWall-First!™ security software and the Java™ Developers Kit make sure you're safe and ahead of the curve. And with Netscape™ Enterprise Server Software built in, it's little wonder Netra is the choice of intranet professionals everywhere. Perhaps that's why PC Magazine and LAN Magazine have piled on the awards. But then what else would you expect? After all, we're the intranet experts. To learn more about what Netra servers can do for you, contact http://www.sun.com or 1-800-786-0785, Ext. 385. **THE NETWORK IS THE COMPUTER™**

Sun microsystems

©1996 SUN MICROSYSTEMS, INC. ALL RIGHTS RESERVED. SUN, SUN MICROSYSTEMS, THE SUN LOGO, NETRA, SOLSTICE, JAVA, AND THE NETWORK IS THE COMPUTER ARE TRADEMARKS OR REGISTERED TRADEMARKS OF SUN MICROSYSTEMS, INC. IN THE UNITED STATES AND OTHER COUNTRIES. FIREWALL-FIRST! IS A TRADEMARK OF CHECKPOINT SOFTWARE TECHNOLOGIES, LTD. USED UNDER LICENSE BY SUNSOFT, INC. NETSCAPE AND THE NETSCAPE LOGO ARE TRADEMARKS OR REGISTERED TRADEMARKS OF NETSCAPE COMMUNICATIONS CORPORATION. ALL TRADEMARKS ARE PROPERTY OF THEIR RESPECTIVE OWNERS.

COMPUTERWORLD

Professional Courtesy Voucher

❑ **Yes,** I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of $39.95* per year - a savings of $8.05 off the basic subscription price.

First Name MI Last Name

Title

Company

Address

City State Zip

Address shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate: $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars. For faster service, fax your order to (508) 626-2705.

SAVINGS STATEMENT

Regular Subscription Price $48.00

Your Special Price $39.95

Your Savings $8.05

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distributor/Retailer
99. Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Assistant VP IS/MIS/DP Mgmt.
21. Director/Mgr. MIS Services, Info. Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech. Planning, Administrative Services
23. Dir./Mgr. Sys. Development, Systems Architecture
31. Programming Mgmt., Software Developers
41. Engineering, Scientific, R&D, Tech. Mgmt.
60. Sys. Integrators/VARs/Consulting Mgmt.

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Assistant VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Marketing Mgmt.
70. Medical, Legal, Accounting Mgmt.

OTHER PROFESSIONAL MANAGEMENT
60. Information Centers/Libraries, Educators, Journalists, Students
80. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems:
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Dev. Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1 At this location	2 Entire Organization
A. 20,000 +	❑	❑
B. 10,000 – 19,999	❑	❑
C. 5,000 – 9,999	❑	❑
D. 1,000 – 4,999	❑	❑
E. 500 – 999	❑	❑
F. 100 – 499	❑	❑
G. 50 – 99	❑	❑
H. 20 – 49	❑	❑
I. 10 – 19	❑	❑
K. 1 – 9	❑	❑

0400 A

COMPUTERWORLD

Professional Courtesy Voucher

❑ **Yes,** I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of $39.95* per year - a savings of $8.05 off the basic subscription price.

First Name MI Last Name

Title

Company

Address

City State Zip

Address shown: ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate: $48 per year

* U.S. Only. Canada $95, Mexico, Central/South America $150. Europe $295. all other countries $295. Foreign orders must be prepaid in U.S. dollars. For faster service, fax your order to (508) 626-2705.

SAVINGS STATEMENT

Regular Subscription Price $48.00

Your Special Price $39.95

Your Savings $8.05

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distributor/Retailer
99. Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Assistant VP IS/MIS/DP Mgmt.
21. Director/Mgr. MIS Services, Info. Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech. Planning, Administrative Services
23. Dir./Mgr. Sys. Development, Systems Architecture
31. Programming Mgmt., Software Developers
41. Engineering, Scientific, R&D, Tech. Mgmt.
60. Sys. Integrators/VARs/Consulting Mgmt.

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Assistant VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Marketing Mgmt.
70. Medical, Legal, Accounting Mgmt.

OTHER PROFESSIONAL MANAGEMENT
60. Information Centers/Libraries, Educators, Journalists, Students
80. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems:
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Dev. Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1 At this location	2 Entire Organization
A. 20,000 +	❑	❑
B. 10,000 – 19,999	❑	❑
C. 5,000 – 9,999	❑	❑
D. 1,000 – 4,999	❑	❑
E. 500 – 999	❑	❑
F. 100 – 499	❑	❑
G. 50 – 99	❑	❑
H. 20 – 49	❑	❑
I. 10 – 19	❑	❑
K. 1 – 9	❑	❑

0400 B

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

MasPar takes on new name and softer edge

By Dan Richman

Say good-bye to MasPar Computer Corp. and say hello to NeoVista Solutions, Inc., the most recent entrant in the data mining field.

Cupertino, Calif.-based MasPar, which in its eight years sold 260 massively parallel machines to military, scientific and engineering sites, last week changed its name and mission, quitting the hardware business to become a provider of data mining software.

Data mining

New page

The shift offers MasPar a fresh start and users an alternative to competitors' data mining software, industry observers said.

NeoVista's Decision Series data mining product is based on pattern-recognition algorithms that MasPar developed with end users of its hardware. Designed for applications such as fingerprint recognition or radar detection, those algorithms were easily adapted to data mining, NeoVista CEO John Harte said.

Data mining refers to discovering unknown patterns within data. It is antithetical to conventional querying of data, which seeks specific answers to specific questions.

Beta user Denise Barnhart, chief of corporate analysis at Army Air Force Exchange, said Decision Series will permit her organization to examine sales trends at a much finer level. Army Air Force Exchange stocks 15,000 stores at bases throughout the world.

"To estimate sales based on buying patterns and demographics, we look at sales by stores and region today," she said. "We think NeoVista will let us drop down to the category or even the product level."

The new software, expected to ship Oct. 1, will compete most closely with Intelligent Miner from IBM and the Database Mining products from HNC Software, Inc. in San Diego.

"[This] breathes new life into MasPar, which flourished in the Cold War days but faded as its proprietary technology couldn't find more generalized uses," said Jeff Liebl, a research analyst at Smaby Group, Inc. in Minneapolis.

What a difference a day makes

Before [illegible]

Name	MasPar Computer Corp.	NeoVista Solutions, Inc.
Main product	MP2, a proprietary massively parallel computer	Decision Series, data mining software

Intel, MCI ink server alliance



Intel and MCI's Web server software *was designed to give users easy-to-use graphic administrative tools*

By Mitch Wagner

Intel Corp. and MCI Communications Corp. teamed up last week to unveil a preconfigured, aggressively priced World Wide Web server, that targets corporate departments and small businesses.

The partners also announced plans to jointly develop technology to beam multimedia over the Internet.

Winning Internet users will be difficult for MCI and Intel, predicted user Geoff Ralston, vice president of engineering at Four11 Corp. in Menlo Park, Calif. Server systems and software aren't strengths for either company, he said.

"Two [companies] not really known for their servers and software are coming in to a market where a lot of big boys with big expertise in that are already duking it out," Ralston said. Four11 runs a directory of telephone numbers and electronic-mail addresses on the Internet.

The NetworkMCI WebMaker incorporates server hardware based on Intel's 200-MHz Pentium Pro processor, with WebServer software, design tools, configuration and three years' service and support.

It is available now and is priced at $9,995.

The design software on the WebMaker server includes a "wizard" that steps users through the process of laying out content online — a cookbook for putting together a simple Web site.

One catch: The $9,995 price tag doesn't include Internet connectivity. MCI will provide that at a cost of $2,000 to $2,300 per month, depending on the speed of the line.

Internet setup costs could run even higher depending on how much wire has to be laid to stretch from MCI's network equipment to the customer business.

Multimedia performance

The multimedia portion of the alliance will see the two companies focus on networking technology to improve performance of multimedia applications on the Internet.

Multimedia apps on the 'net consume huge amounts of bandwidth and are therefore highly susceptible to the kinds of slowdowns and brownouts that are becoming more common as the 'net becomes more popular and demand for Internet services increases.

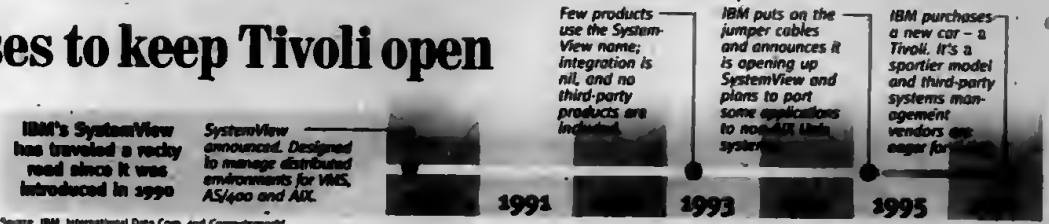
Intel and MCI will work to develop multimedia applications that include real-time video, audio and videoconferencing for the Internet.

The firms wouldn't provide specifics.

IBM promises to keep Tivoli open

By Bob Francis

AUSTIN, TEXAS



Source: IBM, International Data Corp. and Computerworld

Mollifying skeptics in the user community and among other systems management vendors, IBM recently set forth some plans for its Tivoli Management Environment (TME).

Following weeks of meetings here, systems management vendors said IBM appears dedicated to developing and adhering to standards. In some cases, IBM will provide application programming interfaces to integrate third-party systems management products into TME.

"Most of us were satisfied that IBM wants to keep Tivoli open and form tight relationships with the top two or three vendors in each area of system management," said one third-party official who declined to be named.

IBM's goal is to offer systems management tools across eight disciplines, said Brian Burba, an analyst at International Data Corp. in Framingham, Mass.

When IBM acquired Tivoli and its system in January for $743 million, many vendors and users expressed concern about the computer giant's support of systems management products from rival firms. Those third parties wanted assurance that they could continue to plug their software — such as individual applications that provide security, database management, scheduling or storage management — into Tivoli's management framework.

This move on IBM's part toward more active partnerships is comforting news to users, particularly those considering systems management frameworks.

"We're looking at distributed system management frameworks right now, and it's very important [to know] how they're going to work with our third-party solutions," said Anthony Flora, senior vice president at NationsBanc Services, Inc. in Richmond, Va.

"We're still in the midst of deciding what to do," Flora added, "but I don't think we want to have to change our whole organization just to use a framework when we have point solutions that work now."

Third-party developers and some users feared that IBM would give its own products preferential treatment under TME.

"Basically, IBM knows they can't provide the users with all the painkillers, and they made it clear they want to partner with us so they can provide this framework" of point products, said Flip Filipowski, president of Platinum Technology, Inc. in Oakbrook Terrace, Ill.

The NCR Scalable Data Warehouse.



intel inside
pentium

All WorldMark servers shown feature Intel Pentium Processors. The Intel Inside and Pentium Processor logos are registered trademarks of Intel Corp. International Data Corporation "Workstations and High Performance Systems" June, 1995 / International Data Corporation "The Unix Systems Market," September, 1995.

Half the world relies on our data warehouses.

If you're serious about using data warehousing to gain a competitive edge, choose NCR. The company that IDC says is number one worldwide in data warehousing.[1]

NCR – a name synonymous with business systems for over 100 years. We have the technology and expertise to help you transform mountains of data into nuggets of vital customer information to help you make smarter, quicker decisions. With industry-leading databases like Teradata,® Oracle,® Informix® and Sybase.®

#1 IN DATA WAREHOUSING

Know-how that, in the U.S., the three biggest retailers, three of the top five airlines, five of the seven regional phone companies, and two out of three top banks are already utilizing. Know-how that has made us the world leader in data warehousing with a 50% share, and number one worldwide in UNIX medium-scale systems for two years running.[2]

It's clear: the best system to build your data warehouse on is one of our new, highly scalable WorldMark™ servers. The only platform that scales from SMP, to clusters, to MPP, allowing businesses to start their data warehouse small and grow it to any size. The world's most experienced data warehouse professionals can help you set up and maintain the most scalable data warehouse on the planet.

To get more information about NCR's scalable data warehouse, call 1 800-CALL-NCR, ext. 3000. Or experience our data warehousing capabilities firsthand at: http://www.ncr.com



NCR

©1996 NCR Corporation. All rights reserved. Teradata is a registered trademark and WorldMark is a trademark of NCR Corporation.

Computer Industry

Smaller goals help

Network General Corp. in Menlo Park, Calif., is preparing to broaden its focus on network fault and performance management beyond the Sniffer line of protocol analyzer tools. The vendor last week purchased a preferred stock equity interest in Netsys Technologies, Inc. in Palo Alto, Calif. Netsys provides planning and troubleshooting software for router-based networks. Network General will include Netsys software in a Network Visibility Solution Set to be introduced next month, sources said.

CommVault goes it alone

CommVault Systems, Inc. in Eatontown, N.J., last week became an independent provider of storage management tools for distributed client/server networks. Backed by Donaldson, Lufkin & Jenrette, Inc., managers led a buyout of the former division of AT&T Corp., which was spun off recently as part of Lucent Technologies, Inc.

Microsoft purchase speeds online push



Retailers at EShop Plaza *are moving to a site that is under construction on The Microsoft Network*

By Kim S. Nash

Microsoft Corp. last week bought electronic commerce software maker EShop, Inc. and immediately shut down the company's online shopping mall, which sold clothing, compact discs and other consumer products.

Users previously could click on a merchant's icon at EShop Plaza to get in to the merchant's online store. Now, a click triggers a message that says EShop stores will be transferred to The Microsoft Network World Wide Web site, which is under construction. The message advises users to leave their electronic-mail addresses so that they can be notified when the migrations are done.

Some EShop retailers, such as Avon Products, Inc. and Spiegel, Inc., could still be reached via their own Web sites. But Tower Records and Video and others don't run separate sites.

Two retailers contacted by *Computerworld* didn't know that access to their online stores had been cut off.

Electronic commerce

The acquisition of EShop, in San Mateo, Calif., means Microsoft must port EShop's Unix-based commerce software to its Windows NT operating system. Financial terms of the deal weren't disclosed by either company. Microsoft has promised to ship an NT version of EShop by the end of the year. Beta tests will start in August.

May not reopen

But some EShop merchants said they didn't know if they wanted to reopen at the NT-based mall.

"There may be some issues because all our data is in a Unix database," said a spokesman for The Good Guys, an electronics chain based in Brisbane, Calif. The Good Guys, which is an IBM RS/6000 shop, "will probably let EShop make those decisions," he said. "That's why we signed up with them; otherwise, we'd have built a shopping mall ourselves."

The acquisition will jump-start Microsoft's original plan to ship electronic commerce software by the end of the year, but it doesn't put it ahead of Netscape Communications Corp. or Open Market Corp., which already offer such applications.

Buying EShop's products knocks one to two years off Microsoft's development cycle, according to Paul Maritz, vice president of the platforms group at Microsoft in Redmond, Wash.

The vendor had planned to introduce Microsoft Merchant by the end of the year, but the first version wouldn't have included advanced features such as complicated inventory tracking capabilities or custom Web page generation for repeat shoppers. "This lets us ship elements [that] we would have gotten to only in Versions 2.0 or 3.0," Maritz said.

Minicompanies in megamerger

By Frank Hayes

Question: When does a $40 million company merging with another $40 million company equal a deal worth an estimated $900 million?

Answer: When stock values of the two companies are sky-high.

Just how out of whack some software company valuations have become was evident earlier this month when Pure Software, Inc. announced plans to merge with Atria Software, Inc.

Mergers & acquisitions

When the stock-swapping deal goes through, Atria shareholders will receive about $900 million in Pure stock. That is more than 20 times the $40 million in sales achieved last year by Lexington, Mass.-based Atria.

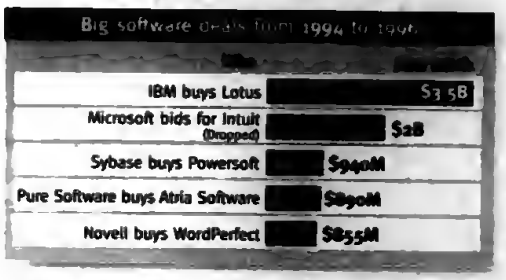
"That's an outrageous valuation for the company," said Ed Bierdeman, research director at Dakin Securities Corp. in San Francisco. "Until recently, the only stocks trading that high were Internet stocks, and they're trading on hype."

On the low end

By comparison, Hewlett-Packard Co. and Sun Microsystems Inc. are valued at about 1½ times their sales, and even high-flying Microsoft Corp. is valued at less than eight times its revenue.

But Pure, in Sunnyvale, Calif., didn't hesitate to pay the price — in part because its stock is worth roughly 15 times its annual revenue. "The price was determined by the public market," said Chris Tuttle, an analyst at SoundView Financial Group in Stamford, Conn.

The merger of Pure and Atria makes sense, said Dick Heiman, an analyst at International Data Corp. in Framingham, Mass. Pure sells tools for testing software under development, and Atria's products manage the development process.



"I'm pretty positive on this. But I find it hard to believe that a company with $80 million in revenue is worth $1.7 billion," Heiman said.

Skyrocketing stock prices have become a hallmark of Internet-oriented companies such as Netscape Communications Corp. and Yahoo, Inc. But valuations of Pure and Atria have pushed into record-breaking range a merger that might otherwise be routine, analysts said.

Less than two years ago, database maker Sybase, Inc. paid what analysts called a premium price of $940 million for Powersoft Corp. This is roughly Atria's price, though Powersoft had three times Atria's sales.

Not all big-money software acquisitions have fared well. IBM's $3.5 billion purchase of Lotus Development Corp. in Cambridge, Mass., has seen less than spectacular results. And Novell, Inc.'s ill-starred $855 million purchase of WordPerfect Corp. ended earlier this year when Corel Corp. took over WordPerfect for a fraction of that price.

Stocks drop

In fact, the market responded negatively to the Pure/Atria deal. When the merger was announced, Pure stock was at $39.50 and Atria at $64. Within a week, Pure had fallen to $36, and Atria had dropped to $54, reducing the merger's price from $973 million to $890 million.

But in this case, "what you call the price of the deal is really irrelevant," said Paul Hilal, a principal at Broadview Associates LLC, a Fort Lee, N.J., merger and acquisition advisory firm. "It's like saying you've bought a billion-dollar dog and paid with two $500 million cats." They may be overpriced, but they are all overpriced about the same, he said.

COMPUTERWORLD

Photoshop 5

Strategy no longer equates with long term. The economy is volatile, resources are severely constrained and competition is global. The pace and complexity of business have grown by orders of magnitude. Threats and windows of opportunity come and go in weeks or months. Businesses have had to learn to be dynamic and capable of numerous simultaneous initiatives. Strategy can no longer be planned years in advance.

This fundamental business change demands an equally dramatic change in the role of management, information systems management included. The executive who attempts to determine strategy and personally manage its implementation quickly becomes a bottleneck. A command-and-control-oriented "foreman" cannot hope to handle the diversity of challenges the organization faces.

The CIO as foreman

Consider the management style of the chief information officer at a high-tech equipment manufacturing company. The company had grown rapidly into worldwide markets, and its aging data processing systems couldn't handle the increased demands for throughput, flexibility and integration. The CIO determined that a complete revamp of all the legacy applications was warranted.

So the CIO committed the IS organization to an aggressive multiyear plan. He acquired a complex multiple-application client/server package, and the IS department embarked on its worldwide rollout.

Then the problems began.

Problem 1: Missed deadlines. The IS department couldn't deliver the project on schedule. The time estimate for the project was based solely on the CIO's knowledge of project management. It didn't benefit from his staff's much deeper understanding of the legacy applications that had to be converted, or take into account other commitments — such as keeping the current business running — or the staff's abilities and learning curves.

Problem 2: Poor management. The CIO devoted most of his time to managing the project rather than improving the organization's ability to manage projects.

With his time limitations, he couldn't look after every detail. The project was too big and complex for one person to manage, no matter how bright that person may be.



Problem 3: Missed opportunities. The IS department did little besides keep the business running and implement the package. The CIO was the only channel for identifying new projects, so virtually no effort was put into discovering "golden apples," or well-focused tools to help key executives succeed with their business strategies. The entire department focused on administrative applications, so they missed potentially high-payoff opportunities and many client executives felt ignored.

Manager vs. leader

This CIO may have been a decision maker, but he was not a leader. He ignored the extensive knowledge in the organization, thinking that he knew better than his staff. And since everything had to funnel through him, he became the constraint. Meanwhile, he did nothing to ensure that the organization was able to implement his decisions. When this CIO was asked to leave, the company inherited an IS function no more capable of delivering strategic value than it had been when the CIO arrived.

The model of the executive as foreman may be obsolete, but many

Illustrations by Eric Berman

managers still manage this way. The result is wasted time, talent and opportunities.

IS needs leaders, not managers. Managing is the time spent supervising people and doing the day-to-day work of the organization; leadership is the time spent improving the way the organization operates.

Empowerment, that hackneyed term that gets a lot of lip service but very little respect, is at the core of good leadership. But if empowerment means anarchy, organizations will fail. Empowerment cannot occur unless management direction is replaced with other coordination and control mechanisms.

The organizational environment can be designed to send signals that guide everyone in their work. By "programming" the organization, leaders can subtly influence every decision, every day, without disempowering and micromanaging people.

With every bright mind engaged, a well-designed organization can be highly responsive on many fronts.

Visionary leadership

The CIO at a large petrochemical firm — let's call him Bill Smith — provides a positive example of leadership. Bill manages a reliable, cost-effective IS organization, and midlevel business managers throughout the corporation have been reasonably satisfied with its services.

But about three years ago, Bill saw trouble on the horizon. Senior executives did not view IS as strategic; they were grumbling about costs and lack of responsiveness, and some were proposing decentralization and outsourcing.

Meanwhile, IS staff were overworked and underappreciated and had virtually no time to learn new technologies and skills. IS provided only limited guidance on architectural standards. Furthermore, the department was failing to recover its costs through chargebacks, a risky proposition in a corporation that was downsizing.

Bill took action with the help of his senior IS management team. They interviewed key business-unit managers about their concerns with the IS department and surveyed IS staff about departmental problems.

The team then met in a series of workshops. In the first workshop, they discussed visionary expectations



of the department and assessed the gaps in their ability to meet these expectations.

In the next workshop, they analyzed all the issues raised by clients and staff members and their own assessment of gaps. They found four major areas of concern:

- Poor relations with clients.
- More work than they could handle.
- A lack of technology innovation.
- Little leadership on technology architecture.

In each case, the team analyzed root causes.

For "poor relations with clients," they traced its roots to a number of things:

1) **Culture.** The IS culture didn't include the practice of forming clear contracts, leading to misunderstandings over the scope of projects. And because there was no internal consultancy, no one was available to review all the business that the client was doing with the IS department.

2) **Structure.** The IS department's structure didn't include a full-time consultancy function that could serve as an account representative, so executive-level clients felt ignored.

3) **Methods.** Executives felt IS wasn't delivering systems that contributed in significant ways to the clients' business strategies. The management team recognized that its methods of identifying strategic opportunities (finding high-payoff applications for clients) and measuring benefits (documenting the payoff of

The Organizational OS

The five dimensions of organizational design can be likened to the organization's "operating system":

1. Culture: The behavioral patterns (habits and conventions) generally adopted in the organization. Indications of the need for cultural change include a lack of customer focus, entrepreneurship, empowerment, quality or teamwork.

2. Structure: The definition of jobs and the reporting hierarchy, as well as the processes that combine people into teams as work flows across organizational boundaries.

3. Methods: The procedures, methods and skills that people use, such as project management, customer service, entrepreneurship and marketing and business planning.

4. Internal economy: The budgeting, priority setting, chargeback and project-approval processes that determine how resources flow.

5. Metrics: The feedback loops that inform people about how they are doing, and the incentives for improving performance.



You have to accommodate the past.

Prevail in the present. And remain

flexible into the future. Feel any pressure?

What computer company do you work with?

You should be working with Hewlett-Packard, a company that knows how to make client/server solutions work in the real world. Over the years, HP has helped thousands of companies successfully transition to flexible open enterprise computing. And we can do the same for you. If the business decisions are yours, the computer system should be ours.

Hewlett-Packard Computer Systems

HEWLETT® PACKARD



IS investments) were lacking. The team attributed these weak methods to the lack of an internal consulting group — people with time to learn and use such methods.

4) Internal economy. Complaints about costs, as well as pressures for decentralization and outsourcing, were partially rooted in the organization's internal economy, which didn't give individual business units control over IS expenditures. Even though IS charged for its services and clients decided what they would buy, prices were confusing, and there were many cross-subsidies.

5) Metrics. External benchmark metrics of costs were lacking, so IS couldn't prove that its services were indeed reasonably priced compared with other IS departments.

The second problem area, "more work than they could handle," resulted in overworked and underappreciated staff and the appearance of unresponsiveness.

Bill and his team traced the root cause to the IS department's internal economy, which failed to balance supply and demand. Prices didn't cover the full costs of producing some products, and supply wasn't allowed to "float" to meet demand. The lack of clear contracts (which is a culture problem) exacerbated this problem.

The "lack of technological innovation," the third problem area, was traced to the IS department's structure and the internal economy. As for structure, the same IS staff were responsible for both innovation and operations. While they were charged with developing new systems software and networking solutions, they were also required to "keep things stable," which squelched innovation.

As for the internal economy, schedules and prices assumed that IS employees would spend 80% of their time on clients' projects; that left little time for learning. Furthermore, there was no source of "equity" funding to finance research and development of new lines of business for the IS department.

And the root cause of the fourth problem, "little leadership on technology architecture," was attributed to the IS department's structure, which had no full-time technology architect or methods for dynamic architecture planning.

The action plan

Bill and his management team then developed an action plan that systemically addressed their concerns. The team committed to an ambitious transformational process that included the following components:

1) Culture. They crafted a set of principles of accepted behavior that could influence in real, actionable ways the day-to-day behavior and decision-making in the department. These principles included themes of entrepreneurship and customer focus. One example: "We offer our customers technical alternatives and inform them of the life-cycle costs of each, and then let them choose."

2) Structure. They restructured the department, beginning with a blank sheet of paper. The new structure includes a consultancy that is dedicated to client partnership and an architecture function that facilitates consensus on standards. The new

A Leadership Action Plan

There are six basic steps that leaders can take in order to build healthy IS organizations:

1. Gather data on clients' and employees' attitudes. You may find a mandate for change.

2. Have your management team think about what will be expected of the IS function in the future. It's probably a lot more than they're doing today.

3. Analyze the root causes of the concerns raised, using the organizational operating system detailed on page 3. The many symptoms recognized by clients, employees and management all probably point to the same few root causes.

4. Don't build organizational structures around personalities or politics; use a systematic principles-based approach applied to each of the dimensions so you don't have to reorganize again next year.

5. Sequence corrective actions into a rational, well-paced transformation.

6. Communicate the symptoms ("we heard you") and the action plan (not the management fad of the month, but an integrated, systemic program). You'll need patience and understanding from both clients and staff.

structure also separates innovation from operations functions to avoid conflicts of interest.

3) Methods. They trained the new consultants in leading-edge methods for identifying strategic opportunities and measuring benefits and trained the architects in dynamic, participative methods of architecture planning.

4) Internal economy. They identified product managers responsible for all the costs of a product line. These people began to redesign the internal economy to unravel pricing subsidies and clarify product revenues and costs, identifying many opportunities for streamlining.

5) Metrics. They benchmarked their costs (favorably) against competitors and advertised the results to client executives.

Bill recognizes that there is more to do, but the results so far are impressive.

Relationships with client executives have improved, and the IS consultants are now participating in the strategic planning of many business units. Top executives were impressed by the benchmarks, and pressures for outsourcing have dwindled. Clients understand the business value of architecture and are enthusiastically supporting standardization. Internal processes have been streamlined, overhead and direct costs have dropped by 15%, and the department is close to its break-even goal.



And while corporate strategies come and go, the IS organization has been stable. It mixes and matches its various entrepreneurs on project teams as needed, and consultants continually work with key clients to identify high-payoff opportunities for strategic systems.

In what is perhaps the highest praise, one business unit manager contracted with corporate IS to take back his local IS group, which was decentralized some years earlier because of frustration with the corporate IS department. Another staff function, finance, is now analyzing how to merge its decentralized IS staff into the corporate department.

Success for the future

To survive in chaotic times, organizations must be dynamic. They must innovate, align with diverse clients' strategies, improve internal processes for project delivery and operations, and integrate their products. And they must do all these things at once, not one at a time as special projects. They also must do them all continually, not once a year as part of a plan.

Executives who try to control everything themselves are destined to fail — and are likely candidates for ulcers.

The proper role of an executive is that of leader, not foreman, focusing on issues of governance rather than technologies and projects.

Through systemic change, leaders build healthy, high-performance organizations that succeed — with or without them. ♦





Additional reading

♦ *Leadership and the Computer*, by Mary E. Boone, Prima Publishing, Rocklin, Calif., 1993.

♦ *The Heart of the Enterprise*, by Stafford Beer, John Wiley & Sons, Chichester, England, 1979.

♦ *Structure in Fives: Designing Effective Organizations*, by Henry Mintzberg, Prentice-Hall, Englewood Cliffs, N.J., 1983.

♦ "Rightsizing Angst," by Alice LaPlante, *Forbes* magazine, June 7, 1993.

♦ "A Sensible Approach to Outsourcing," by N. Dean Meyer, *Information Systems Management*, Vol. 11, No. 4, Auerbach Publications, fall 1994.

Computerworld Leadership Series: *Editor: Bruce Rayner; Managing Editors: Pat Erickson, Joyce Chutchian-Ferranti, Anne McCrory; Designer: Dan Beard. For article submissions, call Bruce Rayner at (508) 820-8195, or E-mail him at bruce_rayner@cw.com. For previous Leadership Series articles, call (508) 820-8125. Also, see Computerworld's Web site at http://www.computerworld.com.*



HEWLETT® PACKARD

Don't miss Computerworld's Leadership Series



Our Leadership Series brings provocative thought leadership to the pages of Computerworld every month. This special monthly feature is a must-read for CIOs, CFOs and CEOs. The Computerworld Leadership Series spotlights the perspectives of prominent thinkers in the IT world on a wide range of topics and can help put you on the road to strategic success.

A Special Monthly Editorial Feature in Computerworld That Helps Put You on the Road to Strategic Success



In this issue of Computerworld:

The New Organizational Operating System

Traditional strategy is out the window. Forget your five-year business plan based on a few key goals. Today, IS managers need multifaceted strategic plans that can be updated every few weeks or months. This month's Leadership Series author explains how IS executives need to change the way they plan and how they think. The executive who attempts to determine strategy and personally manage its implementation quickly becomes a bottleneck. The command-and-control foreman cannot hope to handle the diversity of challenges the organization faces. What's needed is a new organizational operating system.

Don't Miss These Upcoming Leadership Series Articles

- *The new technology executive*
- *Exploring webs of alliance*
- *Fostering IT creativity*

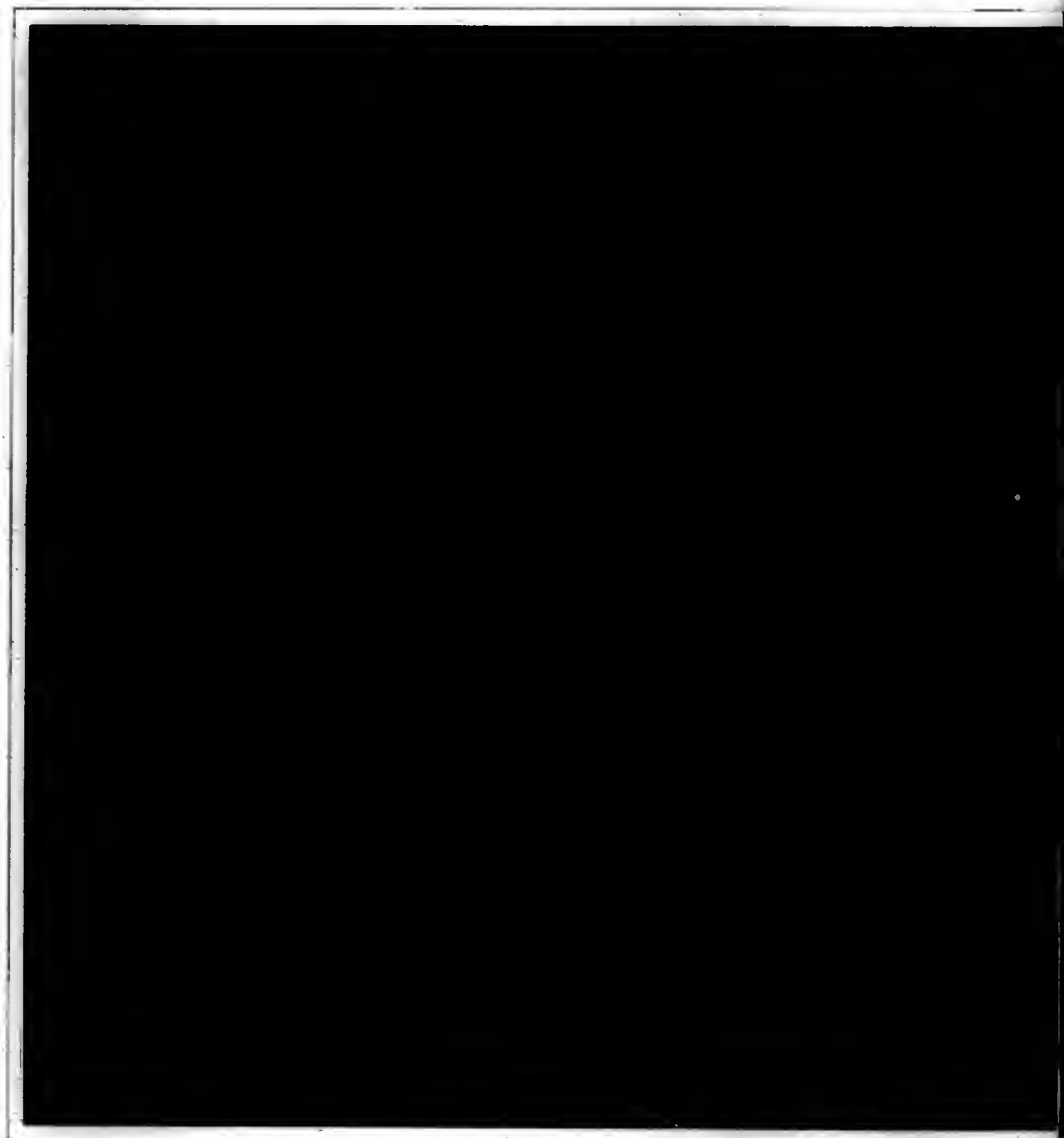
To Request a Copy of Previous Leadership Series Articles

Contact Sharon Bryant, Computerworld reprints manager, (508) 820-8125, fax: (508) 875-0733, or contact her at sharon_bryant@cw.com. Copies of previous Leadership Series articles are available for $4 each plus postage.

Previous Articles Available

Governance: The New IS Agenda by Paul A. Strassmann
The Role of the CEO in IT Decisions by Bill Carico
Transforming the CIO by Thomas H. Davenport
Knowledge, Information, Learning and the IS Manager by Christopher Gopal and Joseph Gagnon
Into the Infocosm by Glover Ferguson
The Eastern Road to IT by Shuji Honjo
The Enterprise Engineer by James Martin
Building an IT Management Flight Deck by Howard A. Rubin
Rebuilding the IS Organization by Robert A. Zawacki
The Recentralization of IT by Ernest M. von Simson
The New CIO/CEO Partnership by Harry M. Lasker and David P. Norton
Evaluating the CIO by Thomas J. Buckholtz
Staffing for the Future: A Leadership Roundtable by Bruce Rayner
Chaos and the IS Executive by Christopher Meyer

COMPUTERWORLD
Everything you need to know.

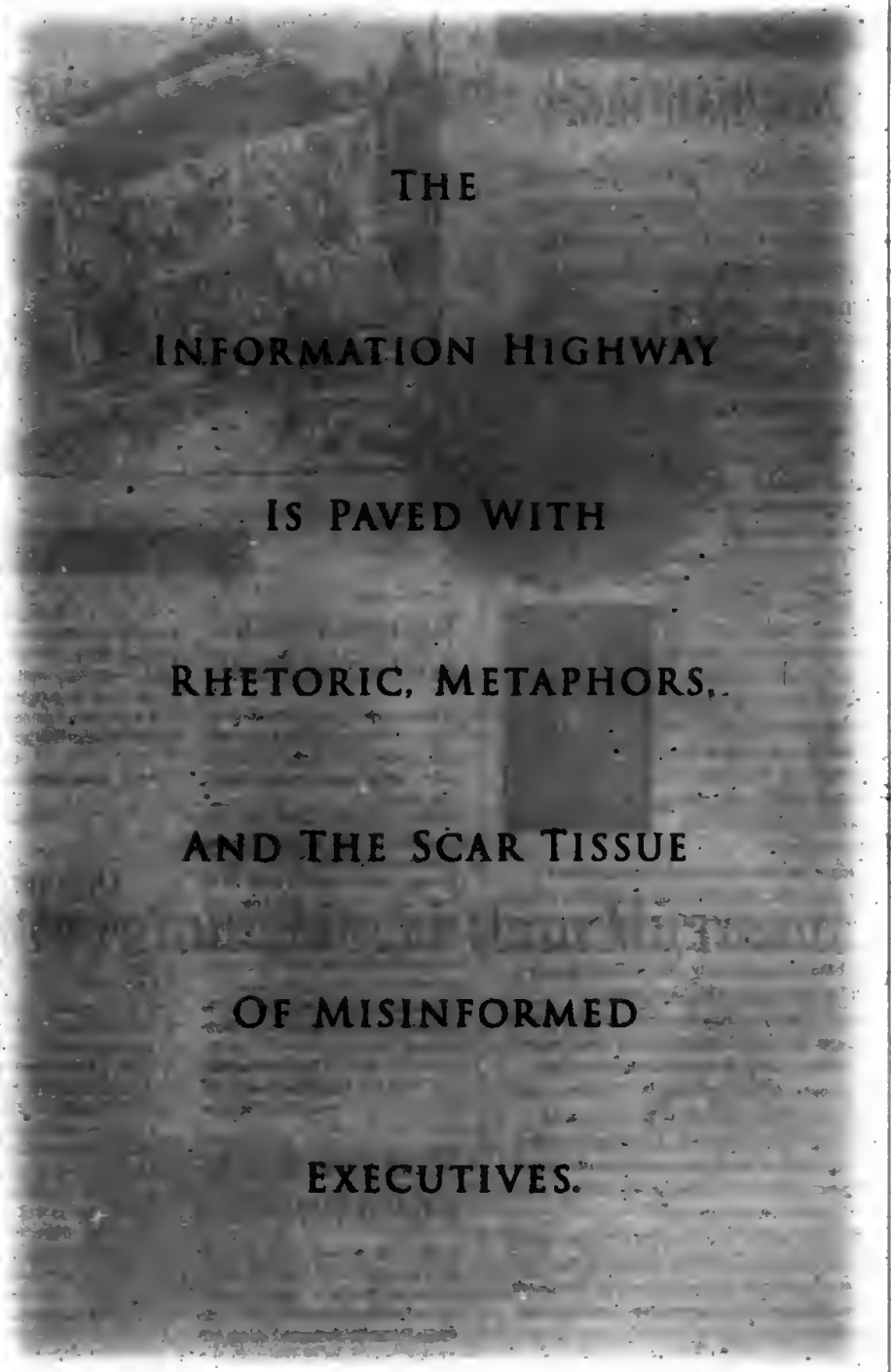


The rush to do business on the Internet is on. The question is, what will ultimately separate the winners from the losers?

A deciding factor will be your alliance with strategic network partners. Alliances that can help you capitalize on all the power the Internet has to offer. And when it comes to the Internet, there is no better partner than the people of Cisco Systems.

We didn't just arrive on the information highway yesterday. In fact, we're one of the pioneers who helped create the Internet.

Almost every message that travels over the Internet moves through Cisco equipment. And our Cisco IOS™ software is the core technology that empowers different hardware devices on the Internet to communicate with each other regardless



of their make or brand name, ensuring smooth, secure communications whether they're going around the corner or the globe.

All of this makes us uniquely able to help you build the type of infrastructure your company needs to employ the Internet for marketing, customer support and most importantly, more sales.

The metaphors, rhetoric and promises will only carry you so far. In the end, experience and expertise will surely take you much farther down the road.

Visit us on the Web at www.cisco.com. Or give us a call at 1-800-778-3632, ext. 159108. We'll help to ensure that your company's trip on the Internet is a safe and profitable journey.



THE NETWORK WORKS. NO EXCUSES.™

From outside the United States, phone Cisco USA 408-526-7209, Cisco Europe 32-2-778-4242 or Cisco Australia 61-2-9935-4107

Love/hate story

I recently asked a group of managers from manufacturing companies how many of them work regularly with their information systems departments. Nearly all of the 300 or so people raised their hands. Then I asked who *likes* their IS department. Fewer than 50 hands stayed up.

That's sobering news if you're in IS. But unfortunately, such anecdotal evidence is all too common these days. And it's backed up by our annual survey of top business executives' attitudes toward IS, which begins on page 84 of this issue.

While the managers we surveyed were overwhelmingly positive about the contribution that information technology is making to their businesses, more than half were less than satisfied with the quality of application development, project management and flexibility coming out of their own IS departments. As one financial analyst commented, "There are good people [in IS]... but all too often they're order-takers and backlog creators."

Evidence like this tends to bolster a suspicion I've had for some time: The IS function as currently defined in most large corporations can't be done. IS professionals are trying to help their business partners navigate a river of business opportunity while swimming against a relentless current of technology change.

Consider that a year ago, most IS organizations were wrestling with what to do about two-tier client/server and Windows 95. Now they're worrying about Java, intranets and multitier client/server. Who can execute strategic plans when the technology environment changes so fast? How can users, who are accustomed to buying new desktop systems and software every 12 months, be convinced that transitioning to a new set of financial applications takes longer?

Perhaps the answer is, as the bumper sticker says, to think globally and act locally. Executives no longer have to be convinced of the business value of IS. But they do want their IS groups to be responsive, interactive and interested.

Maybe it's time to think less about re-engineering and more about help desks, training and putting more of your staff out there with screwdrivers in their hands.

Paul Gillin, *Editor*
Internet: *paul_gillin@cw.com*
www.ultranet.com/~pgillin



Top reason not to print sexist drivel

There is nothing insightful about the "Top 10 reasons why computers must be male" list that you unfortunately republished ["Inside Lines," CW, June 3].

This is sexist drivel and extremely insulting to men. I would suggest you reread the same list as "Top 10 reasons why computers must be female" and see how it feels from your perspective. It just promotes the current fashion of male-bashing that is so prevalent in much of the media and advertising in recent years.

Printing this list is degrading to the reputation and quality of *Computerworld*.

Steve Perrenod
Mountain View, Calif.
perrenod@sgi.com

3Com switch swap pays off in goodwill

I would like to respond to ["3Com pulls switches," CW, May 27]. As an owner of 25 single power supply 3Com LANplex 2500s on a large network, I want to commend 3Com for quickly and efficiently replacing our LANplexes.

We knew about the power supply connector problem late last year but decided to hold off on replacement until it was convenient.

Because we tolerate no network downtime, we were happy that 3Com decided on a swap-out program whereby they shipped us new units in advance. The new units had updated software and newly revised motherboards.

We did a quick configure, put them in place, powered them up, swapped the cables over and were done — with no downtime.

The swap-out program may have cost 3Com some money, but it pays for itself in customer goodwill.

David W. Foss
Computer systems manager
MIT
Cambridge, Mass.

Options to avoid GPFs

Maybe the article "Memory leakage the cause of GPFs" [CW, May 27] should have said, "GPFs are a fact of life *for Microsoft users.*"

For years I have run Unix systems that never had a General Protection Fault. My UnixWare system didn't crash in three years of constant use. My Mac doesn't have GPFs, either, and OS/2 was very robust for me as well. Let's not forget that there are options other than Microsoft.

Skip Stewart
Washington
76116.230@compuserve.com

Hey, buddy, got a PowerBook?

I saw your report ["Mission Implausible?" CW, May 20] that an Apple PowerBook is used in the new *Mission: Impossible* movie. Why, to light the fuse?

Paul Wetor
Milwaukee
pjwetor@mke7.ru.rockwell.com

Mobil's IS is OK

Regarding "Mobil revamp devastates IS" [CW, April 29], your reporter came to Mobil to write an article on the subject of electronic commerce. We were happy to assist his research.

The story is clearly about electronic commerce. What I find difficult to understand is how the headline came to appear above such an article. It seems unrelated.

Mobil's restructuring has not "devastated IS." Restructuring initiatives have been undertaken throughout the company's business operations with one specific purpose: to allow us to continue to compete effectively. This same process underlies our interest in electronic commerce — to cut costs while improving the way we manage our business.

I would also like to correct a significant error: Ms. McCoy's name. She is Ellen I. McCoy, not Eileen M. McCoy as reported.

We feel the headline misrepresents the situation in our IS group, which is making groundbreaking steps into the field of electronic commerce, much as described in the rest of the article.

Christopher O. Springham
Media relations
Mobil Corp.
Fairfax, Va.

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Paul Gillin, Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Michael Gentle

Find out if you're a U.S.-centric IS manager



Do you balance the IS requirements of headquarters and foreign business units?

Multinational companies usually have a corporate information systems office or committee that handles international standards and coordination. It tries to reconcile the IS needs of business units in different countries.

Like all corporate functions, its performance and approach can vary widely.

On one end of the spectrum, this office is a lean, internationally street-wise organization that skillfully balances corporate and domestic requirements. At the other end is a bloated, inward-looking bureaucracy that supports numerous technology standards, even when they aren't practical in some countries.

How do you rate?

Where does your organization sit on this scale? Take this test and score one point for each statement that is true in your international division.

1. A U.S. project leader proposes a key meeting with his European colleagues for May 1. He is surprised to find that no one else is working that day. (It's Labor Day in much of Europe.)

2. The corporate IS department is 100% composed of staffers who haven't worked abroad. Their idea of foreign business awareness is knowing that date fields in the rest of the world are written day/month/year.

3. Software selection committees don't have international representation. Members are techies for whom adherence to alphabet-soup standards — with a half-life of six months — is more important than local business needs and the presence of adequate incountry technical support.

4. The Very Important Planning Committee concludes that, because the new sales-automation package has been successfully pilot-tested in Puerto Rico and Poland, the product should have no problem scaling up to larger and more complicated markets such as England and France.

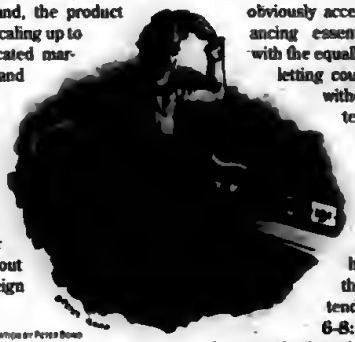


Illustration by Peter Bono

5. The IS department imposes the "worldwide, QWERTY keyboard standard" so traveling executives from headquarters can check their electronic mail from abroad without having to deal with foreign keyboards.

6. Telephones in all subsidiaries are identically programmed, right down to the function keys, so employees who are traveling abroad can phone home without having to ask the natives how to get an outside line.

7. Headquarters issues a condescending International Cabling Standards handbook, which warns foreign personnel not to plug a server in to a washroom shaving outlet.

8. Corporate staffers are viewed as productive only when they visit other countries, thereby making frequent-flier miles an acceptable measure of performance for the annual review.

Scores:

0: A first-class act! Your organization has obviously accepted the necessity of balancing essential corporate standards with the equally essential requirement of letting countries run their business without too much disruptive interference from corporate headquarters.

1-5: Beware! Bureaucratic tendencies have begun to set in. If not checked soon, corporate IS will be more of a hindrance than a help to the business units it's intended to serve.

6-8: Yours is an internal-looking organization with a vested interest in having as many standards as possible (including frivolous ones), whether or not they're adequately supported by a business case. In short, the bureaucracy is a cross between the United Nations and the federal government.

Gentle is an IS project manager at SmithKline Beecham Pharmaceuticals in Paris.

Susan Scrupski

An unshackled giant, bigger than Microsoft



Get ready for an emancipated EDS, which may transform the technology industry.

The liberation of Electronic Data Systems Corp. from General Motors Corp. will affect not only the computer services industry but, over time, the larger worldwide technology market.

With revenue that topped $12 billion last year and an employee base of more than 95,000 worldwide, EDS (as has been aptly pointed out by *The Wall Street Journal*) is already larger than technology giant Microsoft Corp.

During the past decade, the growth of EDS has been fueled by an aggressive sales machine and a fertile market opportunity. Some of the transactions the company pursued privately and publicly were on such a grand scale that, if brought to fruition, they would have changed the technology landscape considerably — possibly irrevocably.

Ready to roll

Consider the attempted EDS and Sprint Corp. merger. In its day, it would have been a seminal example of a "convergence" titan, with the kind of computing and communications muscle to create a new breed of 21st-century technology player.

EDS faces new possibilities. Armed with the flexibility and strength of trading with its own stock, EDS could make a play for any niche company. The possibilities are endless: Will it be Netscape Communications Corp.? Tele-Communications, Inc.? Dow Jones & Co.? MCI?

Even though GM has been a good parent — GM left EDS alone to pursue its business objectives — the relationship hamstrung EDS in many ways. There were clumsy issues about trying to negotiate million-dollar mergers and acquisitions while dealing with "alphabet" pseudostock (GME) that GM set up for the EDS unit. EDS even had to back off from certain agreements because the resultant debt ratios would have had a negative impact on bond ratings for other GM businesses.

These complex financial hurdles were clearly outside EDS' control or influence, and they kept EDS from living up to its own high expectations.

GM last year gave EDS a precious gift — although, I wonder how many recognized it as such at the time. GM's pension fund had been seriously underfunded, so the company moved more than $6 billion of EDS' GME shares into the fund. Company officials hoped the class E shares would breathe some life and growth into the fund.

What this seemingly innocuous financial transaction did was change the balance of power for EDS in its relationship with GM. Almost overnight, it became glaringly obvious that what was good for EDS was very good for GM. Now EDS had a powerful tool with which to begin its flight to freedom and independence.

EDS early in April appointed a new, post-spinoff board of directors. Heavyweights such as Robert Kidder, CEO of Borden, Inc., and former Bush administration officials James Baker III and Dick Cheney, will now help EDS navigate its way as a stand-alone corporate entity.

This is the first sign of an in-your-face, highly visible EDS poised to raise its profile as a technology powerhouse. Fairly soon, we'll see the rollout of an estimated $30 million Madison Avenue image campaign for EDS. Once EDS' britches catch up with its size, and the stock bounces back from the initial hits it will invariably take as the company extricates itself from the body of GM, I predict we'll see EDS make a major move regarding a strategic acquisition or a joint venture.

The scale or importance of that transaction will have long-lasting effects on the technology market. It might even write a new chapter of the Information Age.

Scrupski is a consultant at Technology & Business Integrators, Inc. in Woodcliff Lake, N.J., and editor of the industry newsletter "IT Services Letter." Her Internet address is scrupski@tbicentral.com.



* In Canada, with 3-year limited warranty. Average U.S. street price for Pentium processor-based HP Vectra XM 6/75 PC. Monitor not included. HP Vectra PCs come with MS Windows® for Workgroups 3.11 or Windows 95 included. Warranty: first year, on-site, 24 hour, next-day service; second and third year, return to depot. The Intel Inside and Pentium logos are registered trademarks of Intel Corporation. Microsoft and Windows are U.S. registered trademarks of Microsoft Corporation. ©1996 Hewlett-Packard Company PPG422

HEWLETT® PACKARD



RDI Computer announces PowerLite ExtraView, 42

Servers & PCs

Users stick with low end of Unix line

By Craig Stedman

Unix servers keep getting bigger. But many users continue to think small.

Though vendors brag about beefing up their Unix hardware to enterprise proportions, a half-dozen customers said they would still rather spread their applications across multiple low-end or workstation-class servers. The increasing reliability and scaling of high-end servers doesn't negate the advantages of distributing workloads, those customers said.

"Big machines are nice if you're not concerned about your users," said David Pensak, head of computer science research at Du Pont Co. in Wilmington, Del.

Limited impact

To minimize the number of users affected by the failure of a particular server, Pensak's department has shied away from IBM's RS/6000 multiprocessors and instead targets single-CPU machines at specific workgroups.

"If I've got six separate servers for six groups of users, a system crash isn't as big of a deal," he said.

Reducing the risk of widespread user outages was also high on the list of other information systems managers who don't want to gamble that a big box will stay up. Another key benefit that small machines provide is the ability to make changes quickly as business needs dictate, they added.

That kind of flexibility was the main reason CNA Insurance Co.'s Personal Lines division opted to off-load its mainframe-based policy administration application to 10 pairs of clustered Hewlett-Packard Co. servers rather than a single high-end HP system.

"If we decide that we need to do our California processing in California, we can just pick up [that region's] system and move it," said Dwight Wolfe, manager of Unix systems at the Chicago-based division. "We don't have to take a massive server with 12 processors and try to figure how to take that [workload] off of it."

Hardware cost is a more variable issue. Pensak said big RS/6000s are

Low end, *page 42*

Unix systems

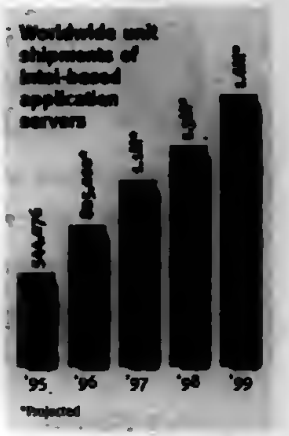
Intel hardware challenges Unix

By Bob Francis

Corporate buyers are taking a closer look at multiprocessing PC servers as prices drop and functionality increases.

Many corporations that stuck with Unix-based multiprocessing servers for applications in the past are now considering servers outfitted with up to four Intel-based processors. At the same time, these users are also checking out lower-end Unix systems, which have dropped in price to meet the PC server competition (see story at left).

"We're looking at Windows NT servers for applications where we wouldn't have considered them before," said Anthony Flora, senior vice president at NationsBanc Services, Inc. in Richmond, Va., the information systems arm of NationsBank Corp. in Charlotte, N.C. The bank currently uses systems ranging from IBM mainframes to Alpha servers from Digital Equipment Corp. But advances at the high end of the PC server market have led the bank to finally look at PC servers.



Source: International Data Corp., Framingham, Mass.

It isn't alone. According to International Data Corp. (IDC) in Framingham, Mass., Intel-based multiprocessor superserver sales increased 152%, from 50,300 units in 1994 to 127,000 in 1995.

Two recent developments are likely to fuel more growth this year. First, Intel Corp. is pushing its high-

Intel hardware, *page 42*

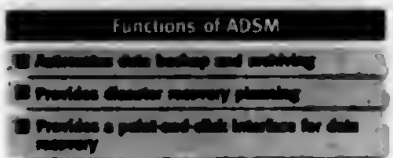
IBM extends data storage management support to NT

By Jaikumar Vijayan

Starting in September, IBM will add Windows NT server support to its Adstar Distributed Storage Management (ADSM) software.

ADSM is IBM's enterprise-wide storage management product that integrates unattended network backup and archiving with storage management and disaster recovery.

Apart from customized data backups and archiving, the key storage management capability that ADSM will include in the NT space is an intelligent incremental backup feature that backs up only new data or changed files, reducing backup time and network traffic. The software also features a business recovery capability for backing up the ADSM database and client data to a secondary site.



"The product is going to have the look and feel of Windows NT, with the full functionality of an enterprise storage management platform," said Lisa Haut, IBM's product marketing manager for ADSM for NT.

What sets ADSM apart from other storage management products is the wide range of platforms and mixed-computing environments it supports, said Rob Enderle, an analyst at Giga Information Group in Santa Clara, Calif. ADSM "is the only distributed storage management product that scales all the way from a PC LAN to a mainframe," he said.

"We've found that ADSM servers for the most part are transparent between platforms," said Kristie Reid, a senior systems engineer at Westinghouse Electric Corp. in Pittsburgh.

"Not too many other products offer the kind of integrated space management and backup" that Westinghouse was looking for, she said. The company plans to use the NT product to locally manage and back up NT servers at several of its smaller sites.

Other vendors with similar products include Legato Systems, Inc., Seagate Technology, Inc. and Cheyenne Software, Inc.

Pricing for IBM's product wasn't available.

INTELLIGENT STORAGE HUB

FOR EVERYONE WHO'S BEEN WAITING PATIENTLY FOR FASTER NETWORK STORAGE.



HOW DOES 50% FASTER SOUND? Probably like a dream, at least to system administrators desperate for a smarter way to manage data. In that case, the Symbios Logic MetaStor SH4000 intelligent storage hub is a dream come true. It's a new storage system that attaches directly to your network and significantly increases throughput. Better still, it's from Symbios Logic, a leader in storage technology.

The solution to managing data across large networks isn't as simple as adding disks, or even buying a new server. Because general-purpose file servers are not optimized for centralized network storage. Our intelligent storage hub is. While storing up to 252 GB, it enables you to support more users and reduce response time. It eliminates bottlenecks, automatically backs up and restores, conserves network resources and controls costs.

How is all this possible? Simple. Everything about the MetaStor SH4000 intelligent storage hub is dedicated solely to worry-free storage. There's no excess code, no traditional speed bumps like virtual memory or application interfaces. It's all about I/Os and an astounding NFS Ops of 1,350. Again, up to 50% faster than general-purpose file servers. But the dream gets even better. Better because our intelligent storage hub also includes high-bandwidth RAID and industry-leading 99.99% data availability. Better because it's designed for easy expansion. And better because its integrated five-DLT-drive tape array means up to 400% faster backup.

METASTOR™

The demand for centralized storage with blazing I/Os has never been greater. And the solution has never been clearer. Or more affordable. The MetaStor SH4000 intelligent storage hub, relief for the storage-hungry masses. To learn more, call Symbios Logic at 1-800-86-ARRAY, or visit our Web site at http://www.symbios.com.



The MetaStor intelligent storage hub attaches directly to your network, increasing data throughput by up to 50 percent.

© 1996 Symbios Logic Inc. Symbios Logic and MetaStor are trademarks of Symbios Logic Inc.

I N T E L L I G E N T S T O R A G E H U B

☐ **Yes**, I've waited long enough for a better network storage solution. I'd like to increase my network storage performance by 50 percent. Please send me more information about Symbios Logic and the MetaStor Intelligent Storage Hub.

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone _____

Fax _____

E-Mail _____

CW0817

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 804 COLORADO SPRINGS, CO

POSTAGE WILL BE PAID BY ADDRESSEE

SYMBIOS LOGIC

SYMBIOS LOGIC
1036 ELKTON DR.
COLORADO SPRINGS CO 80907-9813



SYMBIOS
LOGIC
The Storage Connection

Intel hardware challenges Unix boxes

CONTINUED FROM PAGE 39

end Pentium Pro processors into the superserver arena by providing manufacturers with server motherboards — the basic building blocks of these servers. Companies such as Dell Computer Corp. in Austin, Texas, will use these motherboards for their line of four-processor servers later this year.

Second, Microsoft Corp. in Redmond, Wash., is aggressively pushing Windows NT into the corporate market via alliances with systems vendors such as Compaq Computer Corp. in Houston and strong integration with the company's office application suite.

A double take

Those two factors signal to corporate buyers that these servers are worth a second look for new applications, according to Jim Garden, an analyst at Technology Business Research, Inc. in Hampton, N.H.

A third factor may be the Internet. Analysts expect Internet application servers to meet a growing demand throughout the year. IDC estimated 13,500 Intel-based Internet servers shipped last year. Although the company hasn't yet estimated shipments for this year, it predicted that by 2000, 425,000 Internet servers will ship annually.

- Small servers can be tailored to individual applications or departments
- Upgrades and application changes are easier
- Fewer users are affected when a small server crashes
- Heavy transaction workloads may need a big server and a single database
- With small servers, there are more systems to manage and support
- Isolated pockets of unused capacity may appear on small servers

Despite this rosy outlook, there are still some areas where traditional Unix-based systems have the upper hand on PC servers, Garden said. "There's a tremendous amount of service, support and systems management infrastructure that has been built up in Unix and minicomputer systems over the years, and you don't recreate that overnight," he said.

Some PC server vendors are grappling with those challenges directly, creating links between servers and systems management software. IBM, for instance, is tying its Tivoli Systems, Inc. PC SystemView closely with its servers, while Hewlett-Packard Co. has links with its OpenView platform. Compaq has inked deals with a variety of systems management vendors, including Tivoli, BMC Software, Inc., Boole & Babbage, Inc., Cabletron Systems, Inc. and Seagate Enterprise Management Software, Inc.

Those ties paid off recently when Compaq nailed its largest server deal ever — to supply General Motors Corp. in Detroit with 8,500 servers. According to Marvin Kay, GM's manager of dealer information management, one reason Compaq sealed the deal was because it demonstrated the systems management capabilities of its servers.

Low end

CONTINUED FROM PAGE 39

"way overpriced" compared with buying a bunch of smaller machines. Au Bon Pain Co., a restaurant chain in Boston, also saved money by spreading most of its home office processing across five Sun Microsystems, Inc. workstation servers.

> "A lot of [Unix server vendors] still believe that they have to replace a mainframe with a mainframe. [But a server of that bulk is needed in] a much smaller range of industries than people had thought."
>
> — *Terry Bennett, consultant, Portland, Ore.*

The workstation-class boxes cost a total of about $100,000 when Au Bon Pain made its purchase a couple years ago, said Michael Georgy, the company's technical services manager. A single Sun server with equivalent memory and disk capacities would have cost another $70,000 or so, he added.

On the other hand, Wolfe said, the distributed hardware that CNA buys will probably end up costing more than a single high-end server would have because the insurance company uses relatively beefy midrange systems in its clustered pairs. But the benefit of being able to separate processing on a regional basis outweighed the potential extra cost, he said.

Data warehouses and big transaction applications in vertical markets such as financial services may need the size and power of a monster server, analysts said. Going with multiple small servers also poses integration and remote management challenges for IS.

But relying on an enterprise server would be too much "like going back to mainframe days," said Hugh Allan, database manager at Dunlop Tire Corp. in Amherst, N.Y. Dunlop is migrating from big iron to a network that mixes medium-size and workstation-class Sun servers.

"This is a much less risky architecture," Allan said.

New Products

RDI Computer Corp. has announced PowerLite ExtraView, a SPARC-based portable PC.



According to the Carlsbad, Calif., company, PowerLite ExtraView has a 12.1-in., 1,024 by 768 dot/in. active-matrix display with 4,096 colors and 16 gray scales. It was designed for geographic information systems, computer-aided design and manufacturing and software demonstration.

PowerLite ExtraView has a 110-MHz MicroSPARC II processor, up to three 1.2G-byte 2½-in. hard disk drives, memory capacity of up to 128M bytes, a fax/modem card and a floppy drive or PCMCIA. It weighs 7½ pounds.

Pricing for PowerLite ExtraView starts at $12,995.

▶ *RDI Computer*
(619) 929-0992
www.rdi.com

Sony Electronics, Inc. has introduced CSD-880E, an eight-speed CD-ROM drive.

According to the San Jose, Calif., Sony Corp. division, CSD-880E features a robust spindle motor to minimize vibration and optical pickup with expanded frequency bandwidth. It was designed to use little CPU processing power to increase system performance.

The product has a data transfer rate of 1.2M byte/sec. to support MPEG-2 video and includes a 256K-byte buffer. It comes with an interface card and audio cable.

CSD-800E costs $190

▶ *Sony Electronics*
(408) 432-0190
www.sel.sony.com

IBM has announced new models of the 8235 Dial In Access to LANs (DIAL) servers.

The DIAL Model 051 is for Token Ring networks; Model 052 was designed for Ethernet networks. According to the Armonk, N.Y., company, both models were designed for small offices that need no more than two simultaneous connections. Each has two ports and can be configured with external analog modems or terminal adapters for Basic Rate Interface Integrated Services Digital Network (ISDN) connections. The 8235 Model 140 is intended for large central sites with hundreds of dial-in users. It integrates all the functions of ISDN and analog remote access, communications server and remote routing in a single box. It supports individual modems and aggregated connections.

The three models let customers use standard dial-up phone lines or digital networks to remotely access LAN resources.

Model 052 costs $1,899, and Model 051 costs $2,399. Model 140 will be available in August, with pricing starting at $20,700.

▶ *IBM*
(914) 765-1900.
www.raleigh.ibm.com

Product shorts

Sharp Electronics Corp. has introduced a multifunction printer/fax/copier desktop machine, Model F-2700M. As a laser printer, it features the Windows Printing System and 512K bytes of standard memory that can store up to 39 pages. It has multitasking capabilities that let users print while sending or receiving faxes. The fax machine has fax broadcast features that let users send one document to 50 locations simultaneously. Cost: $1,249. Sharp Electronics, Mahwah, N.J. (201) 529-8948. ... **Hertz Computer Corp.** has announced a line of World Wide Web servers. Configurations range from a basic Windows 95 server to a higher-end Windows NT server. Pricing starts at $3,000. Hertz Computer, New York, N.Y. (212) 684-3658.

Briefs

CacheFlow grows NFS

Network Appliance, Inc., a Mountain View, Calif., maker of dedicated Network File System (NFS) storage servers, has introduced a high-end model that can support up to 300G bytes of disk space. Code-named Godzilla, NetApp F540 starts at $52,900 without any disks. Network Appliance said it also plans to add support for Windows NT and Hypertext Transport Protocol files to its servers this summer.

Phones to access 'net

Nortel, Inc., plans to turn its screen-equipped PowerTouch telephones into Java-based devices for accessing the Internet. The hosted-up phones will use Java-specific chips that are being developed by Sun Microsystems, Inc., the owner of the Internet programming language. Business, home and wireless applications are planned, and customer trials are expected to start next year, Nortel said.

StorageTek names new leader

Storage Technology Corp., a maker of information storage and retrieval systems, has a new CEO, president and chairman of the board — David E. Weiss. Weiss will succeed Lloyd R. Poppa, who is retiring after 21 years at the helm of the company. Weiss has been climbing the StorageTek corporate ladder since his arrival in 1981, after a 23-year stint with IBM.

Count on PowerPC technology. Count on the power behind it.

PowerPC

In the last year alone, millions of PowerPC™ microprocessors were designed into new products, from automobiles to high-end computer systems. In fact, they've already outsold all other major RISC-based desktop microprocessors combined.

And with a 200MHz version (the first ever for volume desktop), the Apple, IBM and Motorola (AIM) alliance is continuing its high-performance leadership. The AIM Alliance is also developing the PowerPC Platform™ specification for a common hardware reference platform, which will allow any user to run the Windows NT,™ Mac™ OS, AIX® and Solaris™ operating systems—all from a single computer.

Of course, the AIM Alliance members aren't just counting on PowerPC technology, they're building a host of products around it. Apple's entire product line is built on PowerPC Architecture.™ IBM has created several lines of next-generation servers, including the AS/400® and RISC System/6000®, on PowerPC technology. And Motorola offers an impressive range of PowerPC microprocessor-based boards and systems, from personal workstations to high-end servers. Plus with our newly opened, billion-dollar PowerPC microprocessor fabrication facility, our commitment is now stronger than ever.

But the people who developed PowerPC technology aren't the only ones who count on it. Companies like Ford, Xerox, Honeywell and others are designing PowerPC Architecture into their products. Creating the momentum that's changing the future of technology forever. Call 1-800-845-MOTO, ext. CW, or visit http://www.mot.com/PowerPC/ to find out more about PowerPC Architecture. And the power behind it.

©1996 Motorola, Inc. All rights reserved. Motorola and Ⓜ are registered trademarks of Motorola, Inc. AIX, AS/400 and RISC System/6000 are registered trademarks, and PowerPC, the PowerPC logo, PowerPC Architecture and PowerPC Platform are used under license and are trademarks of International Business Machines Corporation. Windows NT is a trademark of Microsoft in the United States and/or other countries. Solaris is a trademark of Sun Microsystems, Inc. Mac is a trademark of Apple Computer, Inc. All other brand and product names are the trademarks or registered trademarks of their respective holders.

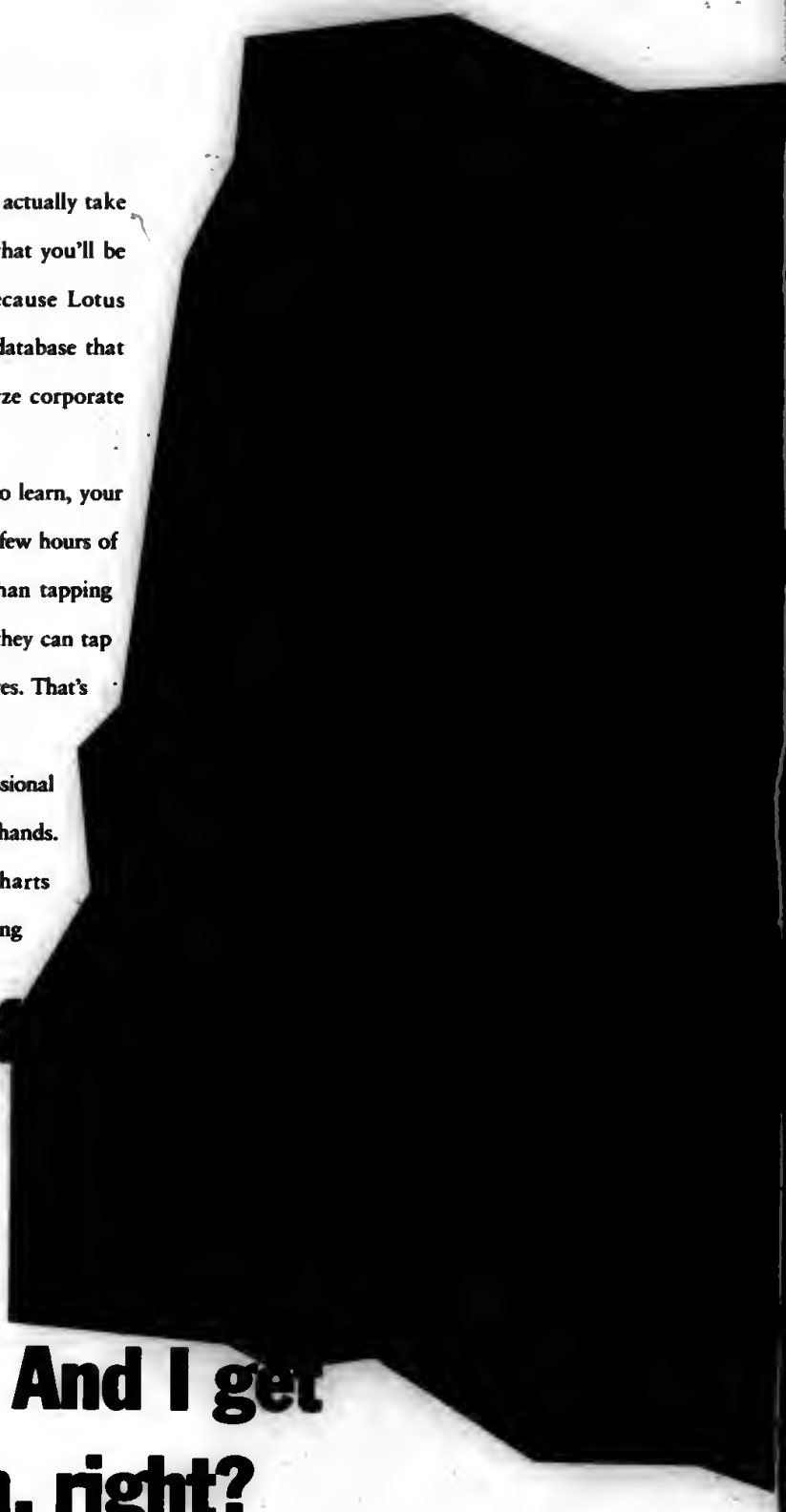
MOTOROLA

What you never thought possible.™

Time. To do your job. To think. To actually take lunch. With Lotus Approach,® time is what you'll be giving the entire MIS department. Because Lotus Approach is a powerful, easy-to-learn database that enables end users to manage and analyze corporate information on their own.

In fact, Lotus Approach is so easy to learn, your users can actually be productive within a few hours of opening the box. Which means rather than tapping you on the shoulder every five minutes, they can tap directly into your corporate data themselves. That's the beauty of Lotus Approach.

Just imagine: end users creating professional reports without you having to hold their hands. Business analysts building their own charts and crosstabs. Users with no programming

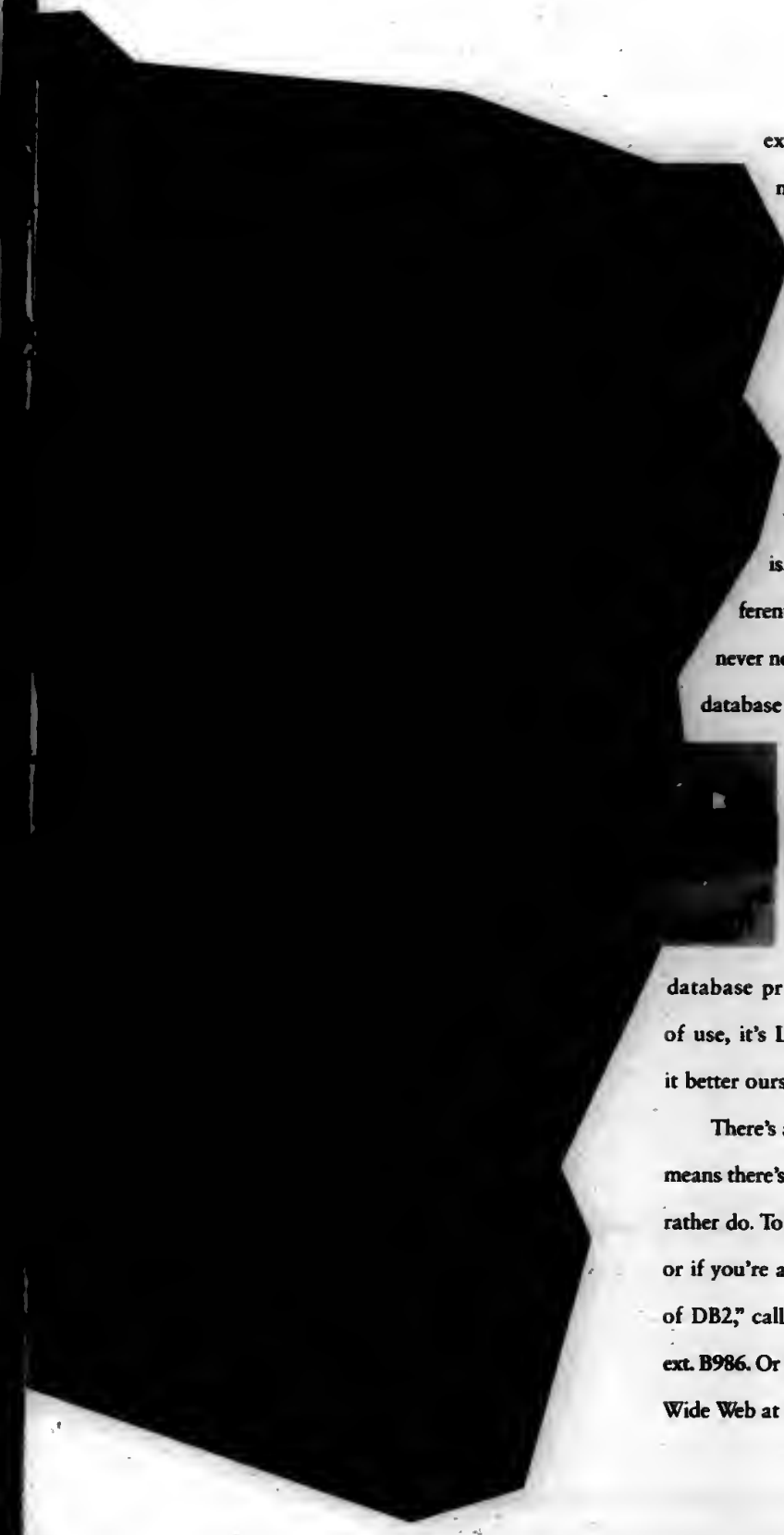


Analyze data f

End

On their own? And I get to go to lunch, right?

In Canada, call 1-800-GO-LOTUS. ©1996 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, Working Together and Lotus Approach are registered trademarks and SmartMaster is a trademark of Lotus Development Corporation. All other products are registered under their respective companies.



experience at all generating completed business solutions in seconds using Approach's new SmartMaster™ applications. And you actually having the time to ponder the dessert menu.

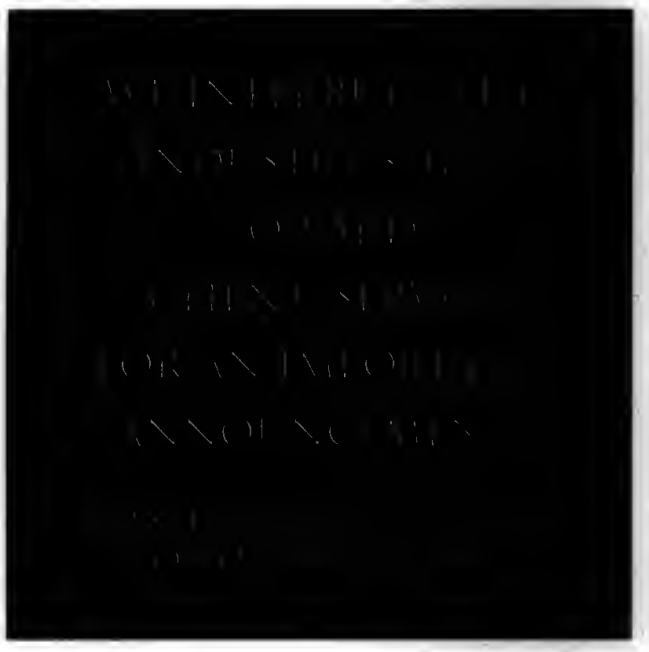
With Approach, it doesn't matter where your data is stored. In DB2,® Oracle,® Sybase,® dBASE,® or almost anywhere else. Approach works with your data as it is, and where it is. Users can even join related data from different database systems. Which means that users never need to copy or convert data into yet another database format just to build reports and analyses.

Further proof that Lotus Approach is the right choice for your users: Lotus Approach 96 just won PC Magazine's "Editor's Choice" award, prompting one reviewer to say, "If there's an effective database product that surpasses all others in ease of use, it's Lotus Approach." We couldn't have said it better ourselves.

There's a lot more Lotus Approach can do, which means there's a lot more time for you to do what you'd rather do. To find out more about Lotus Approach 96, or if you're a DB2 user looking to "Extend the Power of DB2," call 1-800-TRADE-UP, ext. B986. Or visit us on the World Wide Web at www.lotus.com.

Lotus

Working Together®

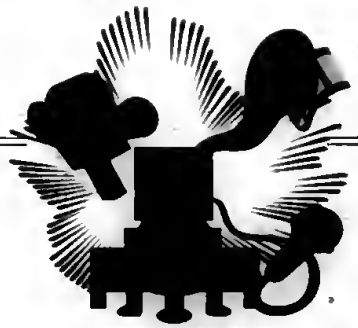


J.D. Edwards is proud to introduce a remarkable new software architecture that delivers all the power and flexibility of networked applications, while transcending many of the technical limitations of client/server. Configurable Network Computing,™ or CNC, can distribute business objects and data across a network spanning your office or the globe. Yet it can tie all your business operations into a single, integrated entity. Better still, your CNC network can include UNIX, Windows NT, OS/400 and MVS systems. You'll find CNC exclusively in OneWorld™ enterprise-wide software from J.D. Edwards, a leader in business software for nearly 20 years, with almost 4,000 customers in over 90 countries. For a free white paper detailing CNC's benefits, call 1-800-727-5333. Or visit www.jdedwards.com

JDEdwards

©1996 J.D. Edwards is a registered trademark of J.D. Edwards & Company. OneWorld and Configurable Network Computing are trademarks of J.D. Edwards World Source Company.

Software



Video on Windows

Nonlinear editing systems used for video editing were on display at this year's National Association of Broadcasters conference in Las Vegas. Here is a breakdown of them by platform supported:



NT vies for star role in video editing

By Lisa Picarille

Microsoft Corp. is staging an aggressive bid to help Windows NT land the plum role as the video editing platform of choice.

Not content for it to be typecast in corporate environments, Microsoft turned in a stellar performance with NT at a recent broadcasting trade show. The traditional marquee stars in this field are the Macintosh and high-end workstations from Silicon Graphics, Inc. (SGI).

At the National Association of Broadcasters conference held in April in Las Vegas, 93 nonlinear editing systems were unveiled. Fifteen of those were NT-based, 10 were based on the Macintosh, and 16 were centered on SGI wares (see chart).

"NT is definitely making very significant inroads in the video editing market," said Bob Turner, a Scituate, Mass.-based contributing editor for *Videography* magazine. He said several major video software developers, including Avid Technology, Inc., demonstrated NT versions of their popular editing systems at the broadcasters conference.

Supports many platforms

Analysts attribute NT's rise in video editing to its ability to run on both Intel Corp. and RISC platforms. Six of the 15 new NT systems will run on Digital Equipment Corp.'s Alpha chip.

In addition, the 32-bit multiprocessing capabilities of NT make it ideal for the processor-intensive task of editing video on the desktop, said Ken Geary, a multimedia specialist at Ademco Corp. in Syosset, N.Y.

"It was a natural to use Windows NT. Most of our clients are on Windows, and using NT puts me in a good position as a producer because I don't have to worry about translating files," said Lee Wojnar, president of Wojnar Productions, Inc. in Philadelphia.

One video producer said NT is gaining momentum.

"There is no longer a prejudice that the Mac is better for video," said a California-based independent video maker, who asked not to be named. "Editors just

NT, *page 61*

Strong Affinity

Users laud Digital plan to integrate NT, OpenVMS

By Jaikumar Vijayan

Digital Equipment Corp. is speeding up the rollout of products and services to help OpenVMS customers integrate Windows NT more easily.

At the recently concluded Digital Equipment Computer User Society (DECUS) conference in St. Louis, for instance, Digital laid out a road map for products scheduled to be released later this year. The company did this even as it was busy rolling out a range of products for users of both operating systems [CW, June 3].

The Maynard, Mass.-based company's plan (see chart) is good news for users, such as the Australian Stock Exchange, that are rolling out mixed OpenVMS and Windows NT environments, said Gerard Smyth, a systems architect at the stock exchange in Sydney.

"The mission-critical part of the system will continue to be on VMS," Smyth said. But for the broker systems at the front end, "we felt that Windows NT was the operating system of choice. Any program that eases software migration between

Affinity, *page 52*



Lotus rounds up partners

By Tim Ouellette

Lotus Development Corp.'s growing posse of Notes-related business partners is a sign to Notes users that their investment is still on strong footing.

From a base of 12,000 third-party vendors earlier this year, including developers, integrators, trainers, consultants and resellers, Lotus expects to have 20,000 channel partners by the end of the year.

While users seem confident, the number of partners can seem overwhelming, said John Hodge, chief information officer at NAC Reinsurance Corp. in Greenwich, Conn. "When you look back three or four years ago, it was difficult to find Notes-based products," he said.

Any downturn in the huge channel that Lotus depends on to install and improve Notes could make users look seriously at World Wide Web-based intranet technology.

"We do see some customers making hard choices now" between Web- and Notes-based applications, said Nina Burns, president of Creative Networks, Inc., a consultancy in Palo Alto, Calif. "There are some sales taken away from Notes, but there is even more opportunity to integrate Notes with the Web."

On the move

Lotus isn't sitting idly by as intranet-based products and groupware offerings from Novell, Inc., Microsoft Corp., Hewlett-Packard Co. and Oracle Corp. hit the market.

Next week at PC Expo, Lotus plans to hold a special business partner briefing to attract new firms to develop Notes software for Internet, messaging and Lotus Components features (see the Components review, page 50).

And a future Internet developer's conference is being planned around Domino — Lotus' Notes server that has native support for the Internet's Hypertext Transport Protocol — as the Web development tool.

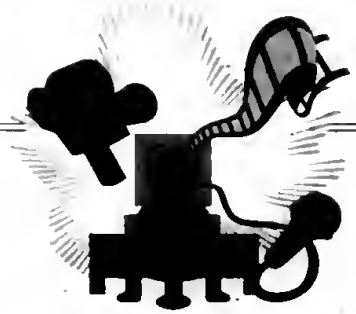
Since Notes is more a development platform than shrink-wrapped software, users depend on third-party firms to customize it and provide applications that fit their needs [CW, Feb. 5]. And with Lotus pushing Notes 4.0 as an enterprise product, companies need more help than ever just to introduce the software to customers.

Noteworthy partners

A sample of Notes developers that have popular Notes applications

[illegible]	[illegible]	[illegible]
Document management	Common Ground Software	Common Ground
Administration	Brainstorm Technologies	Server Admin Plus
	CleverSoft	CleverWatch
Workflow	Onestone Information Technologies	ProcessWare Engine

Software



Video on Windows

Nonlinear editing systems used for video editing were on display at this year's National Association of Broadcasters conference in Las Vegas. Here is a breakdown of them by platform supported:

Platform	New system	Already available	Total
Ma			

NT vies for star role in video editing

By Lisa Picarille

Microsoft Corp. is staging an aggressive bid to help Windows NT land the plum role as the video editing platform of choice.

Not content for it to be typecast in corporate environments, Microsoft turned in a stellar performance with NT at a recent broadcasting trade show. The traditional marquee stars in this field are the Macintosh and high-end workstations from Silicon Graphics, Inc. (SGI).

At the National Association of Broadcasters conference held in April in Las Vegas, 93 nonlinear editing systems were unveiled. Fifteen of those were NT-based, 10 were based on the Macintosh, and 16 were centered on SGI wares (see chart).

"NT is definitely making very significant inroads in the video editing market," said Bob Turner, a Scituate, Mass.-based contributing editor for *Videography* magazine. He said several major video software developers, including Avid Technology, Inc., demonstrated NT versions of their popular editing systems at the broadcasters conference.

Supports many platforms

Analysts attribute NT's rise in video editing to its ability to run on both Intel Corp. and RISC platforms. Six of the 15 new NT systems will run on Digital Equipment Corp.'s Alpha chip.

In addition, the 32-bit multiprocessing capabilities of NT make it ideal for the processor-intensive task of editing video on the desktop, said Ken Geary, a multimedia specialist at Ademco Corp. in Syosset, N.Y.

"It was a natural to use Windows NT. Most of our clients are on Windows, and using NT puts me in a good position as a producer because I don't have to worry about translating files," said Lee Wojnar, president of Wojnar Productions, Inc. in Philadelphia.

One video producer said NT is gaining momentum.

"There is no longer a prejudice that the Mac is better for video," said a California-based independent video maker, who asked not to be named. "Editors just-

NT, *page 61*

Strong Affinity

Users laud Digital plan to integrate NT, OpenVMS

By Jaikumar Vijayan

Digital Equipment Corp. is speeding up the rollout of products and services to help OpenVMS customers integrate Windows NT more easily.

At the recently concluded Digital Equipment Computer User Society (DECUS) conference in St. Louis, for instance, Digital laid out a road map for products scheduled to be released later this year. The company did this even as it was busy rolling out a range of products for users of both operating systems (CW, June 3).

The Maynard, Mass.-based company's plan (see chart) is good news for users, such as the Australian Stock Exchange, that are rolling out mixed OpenVMS and Windows NT environments, said Gerard Smyth, a systems architect at the stock exchange in Sydney.

"The mission-critical part of the system will continue to be on VMS," Smyth said. But for the broker systems at the front end, "we felt that Windows NT was the operating system of choice. Any program that eases software migration between

Affinity, *page 52*

What's next for Digital's Affinity program

Windows Product Suite	Provides gateway required by Windows NT desktop users to access existing data on OpenVMS
Continuous computing	Enhancements to OpenVMS, including high-availability clustering
Transaction processing	Distributes transactions between OpenVMS and Windows NT

Lotus rounds up partners

By Tim Ouellette

Lotus Development Corp.'s growing posse of Notes-related business partners is a sign to Notes users that their investment is still on strong footing.

From a base of 12,000 third-party vendors earlier this year, including developers, integrators, trainers, consultants and resellers, Lotus expects to have 20,000 channel partners by the end of the year.

While users seem confident, the number of partners can seem overwhelming, said John Hodge, chief information officer at NAC Reinsurance Corp. in Greenwich, Conn. "When you look back three or four years ago, it was difficult to find Notes-based products," he said.

Any downturn in the huge channel that Lotus depends on to install and improve Notes could make users look seriously at World Wide Web-based intranet technology.

"We do see some customers making hard choices now" between Web- and Notes-based applications, said Nina Burns, president of Creative Networks, Inc., a consultancy in Palo Alto, Calif. "There are some sales taken away from Notes, but there is even more opportunity to integrate Notes with the Web."

On the move

Lotus isn't sitting idly by as intranet-based products and groupware offerings from Novell, Inc., Microsoft Corp., Hewlett-Packard Co. and Oracle Corp. hit the market.

Next week at PC Expo, Lotus plans to hold a special business partner briefing to attract new firms to develop Notes software for Internet, messaging and Lotus Components features (see the Components review, page 50).

And a future Internet developer's conference is being planned around Domino — Lotus' Notes server that has native support for the Internet's Hypertext Transport Protocol — as the Web development tool.

Since Notes is more a development platform than shrink-wrapped software, users depend on third-party firms to customize it and provide applications that fit their needs (CW, Feb. 5). And with Lotus pushing Notes 4.0 as an enterprise product, companies need more help than ever just to introduce the software to customers.

Noteworthy partners

A sample of Notes developers that have popular Notes applications

Type of software	Vendor	Product
Document management	Common Ground Software	Common Ground
Contact database	Symantec	Act for Notes
Administration	Brainstorm Technologies	Server Admin Plus
	CleverSoft	CleverWatch
Sales force automation	MFJ International	Overquota
Workflow	Onestone Information Technologies	ProcessWare Engine



Microsoft

Community
Latest Technology
Integration
Teamwork
Components
Enterprise

your developers, at least give them an **out.**

WITH TOOLS FROM OUR ENTERPRISE PARTNERS,

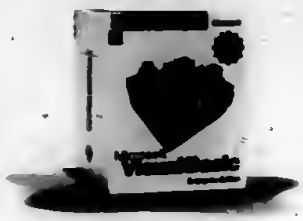
VISUAL BASIC HELPS DEVELOPERS CREATE ROBUST,

ENTERPRISE SOLUTIONS FASTER THAN EVER BEFORE.

Why is it that the people who come to you with big plans have no idea how long it takes to implement them? IS professionals like you are more realistic. You know that robust enterprise solutions take time. But you still need to meet your deadlines *and* keep developers sane.

Now you can, thanks to the Microsoft® Visual Basic® 4.0 Enterprise Edition development system – the first completely RAD tool for distributed client/server development. Remote Automation Technology lets developers dynamically deploy partitioned applications across networks. Which reduces maintenance, increases code reuse, and helps developers deliver more robust enterprise applications in less time.

And, since Visual Basic is an open development system, supported by Microsoft Enterprise Development Partners, your developers will have plenty of options. Like tools for data, object, and process modeling, as well as application testing, maintenance, and bug tracking. Tools that are tightly integrated with the same familiar language used by more than three million developers worldwide. Not some proprietary language known only to a select few.



The RAD tool for the enterprise.
http://www.microsoft.com/devonly/

Still, you might be skeptical. Good IS professionals usually are. Give our DevOnly Web site a whirl at http://www.microsoft.com/devonly/. Or call us today at (800) 228-6139,* Dept. A417, in fifty United States for more information. Your developers may not need a rescue. But with Visual Basic, and the tools you'll find in this brochure, they'll get a leg up on development.

Microsoft

WHERE DO YOU WANT TO GO TODAY?™

© 1996 Microsoft Corporation. All rights reserved. Microsoft, Visual Basic, Visual C++, and Windows are registered trademarks and *Where do you want to go today?* and Windows NT are trademarks of Microsoft Corporation. All other trademarks and trade names are the property of their respective owners. *Offer good through August 31, 1996. In Canada call (800) 563-9048, outside the U.S. contact your local subsidiary.

Lotus Components improve on Notes

Suite of six applets adds functionality

By Garrett N. Ray

PRODUCT REVIEW

Lotus Development Corp.'s soon-to-be-released Lotus Components makes it much easier to share information. And that, after all, is the whole point of using Notes in the first place.

Lotus Components gives users a standard way to embed charts, spreadsheets and project management templates in Notes documents. Until now, that has been nearly impossible to do consistently because one never knows whether a document reader runs Lotus' 1-2-3, Microsoft Corp.'s Excel or something else entirely.

Lotus Components is a set of six ActiveX software applets: spreadsheet, chart tool, project scheduler, comment tool, file viewer and drawing/diagramming application. ActiveX is a conceptual successor to Microsoft's OLE.

Also designed into the suite is a template builder that lets Notes developers customize a component for a special need, such as building a standardized project scheduler for constructing monthly sales reports.

The template builder wasn't included in the initial beta release but was made available in the second beta version, which was delivered after this review was completed.

In the beta-test version of Lotus Components, all applets were fully consistent with the overall look and feel of Notes 4.x; we tested Components while using Notes 4.02. The applets support Lotus SmartIcons, Status Bars, InfoBoxes, task-sensitive menus, help and other enhancements. Because of this, the applets are all fairly easy and straightforward to use.

Yet even though each is a fully functioning, robust application that can be fully embedded in any Notes Rich Text Field (RTF), none of the applets is a substitute for full-fledged applications.

End users can manually add any Component to a Notes RTF from the Create Object menu or the Components panel. Developers have other options, which are mentioned below.

The Components spreadsheet supports an array of formulas and operators — such as SUM and AVG — and, as with all the Component applets, a bevy of formatting options. To exchange data bidirectionally with Notes document fields, one need only declare a cell as a named range and select an Exchange With Notes check box. Lotus/FX (file exchange) takes care of the rest.

Lotus Components beta release

Overall rating: B

- **Functionality: B**
- **Price: A** *$19 per seat for Lotus Passport customers; $49 for single-seat purchases*
- **Usability: C**
- **Integration with Notes: B**
- **Programmability: C** *You really have to be a Notes developer*

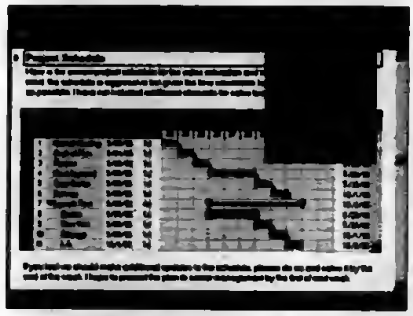
Top applet

The project scheduler is probably the nicest applet in the Lotus Components suite. It adds a simple yet functional application to Notes that it seems the entire software industry has ignored.

The scheduler uses the conventional task, date, duration and bar-chart representation for a project and is a simple way to provide accurate estimates for new or ongoing projects.

As with the spreadsheet, scheduler entries can be exchanged with Notes data fields. The scheduler doesn't support resource management.

The remaining applications — charting, drawing and the file viewer — provide all the functionality one might expect from, say, a Windows 95 accessory program. That is, functional but rudimentary. But the applets can be fully integrated with Notes documents, and that is the main point for considering Lotus Components.



The best of the six applets in the Lotus Components suite is probably the project scheduler

As mentioned above, developers can further integrate individual components into Notes applications and control them with Microsoft's Visual Basic and Lotus' LotusScript 3.0. Through the LotusScript capabilities provided by Notes 4.x, Components can be controlled programmatically via Notes Actions or built in to form designs.

Also worth noting is the minor bonus that Lotus Components can be used in non-Notes applications. For example, a Components schedule can be included in a Microsoft WordPad file.

It would be prudent to ask, "Is this another attempt to lock me in to a vendor's software suite?" The answer, quite simply, is yes. But it is a "yes" qualified by the near-giveaway prices of $19 per seat for Lotus Passport customers and $49 for single-seat purchases.

It is true that you will have to install Windows 95 or Windows NT to provide access to Lotus Components, just as you will to run Lotus Notes 4.x. And your users might increasingly demand that the Notes development staff begin customizing applications around the Components applets. But this could be a small price to pay for adding needed functionality to Notes and your enterprise.

Ray is a writer and consultant in North Conway, N.H. His Internet address is gnray@ssi.com.

Client/server with a mainframe mentality

By Frank Hayes

Information Builders, Inc. (IBI) in New York has rolled out a client/server development system designed to help developers connect mainframe applications with servers, user PCs and the World Wide Web.

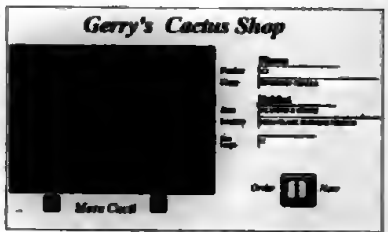
The tool set, named Cactus, is based on IBI's widely used Enterprise Data Access (EDA) middleware. But it adds graphical tools to let users build multitier client/server systems that may include legacy mainframe systems, Windows-based applications and Web sites.

Many development vendors are adding Web support to their tool sets, but most of these sets don't meet the demands of corporate development shops for large, mainframe-oriented applications, users said.

The three Cs

"We wanted the care, custody and control you get from the mainframe, but we didn't want the application on the mainframe. And we didn't want the subtleties you run into with a pure client/server environment," said Jim Wells, chief information officer at Magee-Womens Hospital in Pittsburgh, which is using a beta version of Cactus.

"Symantec and Borland and other companies that come from the PC world don't have that mainframe mentality" focused on data integrity and security, said P. J. Matarese, a senior program analyst at Philips Electronics North America Corp. in Sunnyvale, Calif.



Applications built with IBI's Cactus, *such as this one for a cactus retailer, have Web support*

Because Cactus is built on EDA, applications built with it can access mainframe services, including CICS transactions and IMS data, officials at IBI said.

Cactus also supports packages that use Microsoft Corp.'s OLE architecture, including Windows applications and high-end software from SAP AG and PeopleSoft, Inc.

The development system can also link back-end applications to the Web or to front-end interfaces built using Microsoft's Visual Basic, Sybase, Inc.'s PowerBuilder or other visual development systems. Support for generating applets written in Sun Microsystems, Inc.'s Java programming language will be added later this year, IBI officials said.

Using Cactus, applications are designed with a $3,250 workbench running under Windows or OS/2. But the applications can be partitioned so that parts run on Windows NT- or Unix-based servers.

"It allows you to break up your processing and integrate things in these different environments," said Valerie King, president of Logical Data Solutions, Inc., a developer in Bethesda, Md.

"We're going to be able to give users the Windows software they want but still allow the corporation to keep their data on the mainframe so they can maintain control over it," she said.

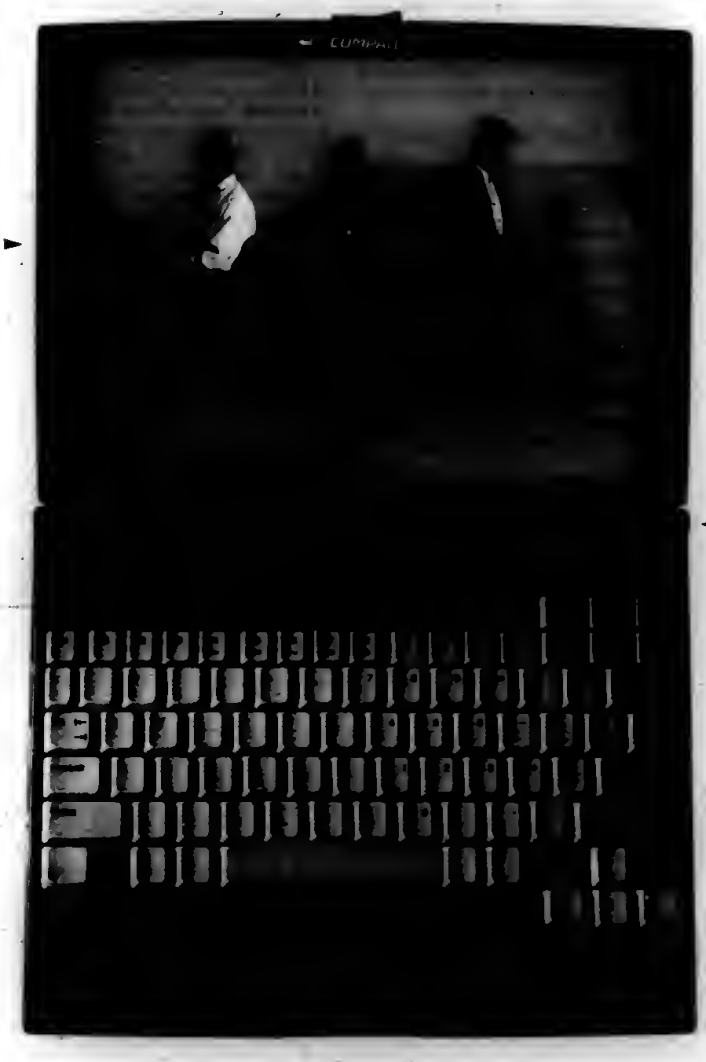
monday

configure 1

- Full-Function Notebook
- Lithium Ion Battery
- Internal Diskette Drive

Detachable lithium ion battery also functions as a handle and a keyboard tilt.

Choice of SVGA displays from 11.3" CSTN to 11.8" CTFT.



Programmable keys provide one-touch access to mobile applications.

Up to 133 MHz Pentium® processor, hard drives up to 1 GB.

I want a notebook that's as flexible as I am. I want it to be full function with a long-lasting battery.

intel inside pentium®

COMPAQ

IBM's DB2 makes its mark with improved OLTP performance

DB2 for MVS 4.2 can handle growing databases

By Dan Richman

Critical performance boosts and greater capabilities in online transaction processing (OLTP) marked the debut last week of IBM's latest version of DB2 for MVS.

One user at the annual DB2 user group conference in Dallas last week said the new version of the relational database management system comes close to — if not even with — the robust OLTP performance of its venerable predecessor, IBM's IMS hierarchical database.

Earlier versions of DB2 for MVS 4.2 "don't handle big enough tables" and can't run 7 days by 24 hours," said Michael Siegal, president of Life Cycle Consulting, Inc., a data warehousing consultancy in Torrance, Calif. "From what IBM says, the new version can handle really big databases — up to 1T byte per table. It also allows online reorganization of databases, which is essential for running around the clock."

Part of the package

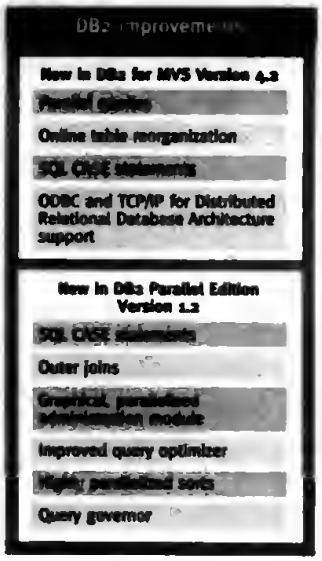
DB2 for MVS 4.2 also adds support for the following:

- Parallel query processing, which increases performance.
- The Open Database Connectivity and TCP/IP for Distributed Relational Database Architecture application programming interfaces, which opens DB2 to outside vendors' tools.
- Computer-aided software engineering statements in SQL, which tighten application code.

DB2 for MVS 4.2 is set to enter beta testing by year's end, but a shipping date hasn't been set.

IBM also announced a version of the DB2 Parallel Edition (PE), which adds features that should swell the ranks of users moving to that version, said Stewart Miller, president of Executive Information Services, a research firm in Carlsbad, Calif.

"As databases keep swelling, [parallel DB2] gets easier to cost-justify because it's increasingly more efficient than single-processor or symmetric multiprocessing DBMSs," Miller said. He said the parallel version, which runs only on IBM's SP2 massively parallel machine, can cost up to $1 million in hardware and software.



Performance boost

Version 1.2 of DB2 PE, which ships next month, gave overall performance increases of about 10% to beta tester Greg Leibman, chief data warehouse architect at Black Diamond Data Systems, Inc., a New York consultancy.

Despite new features such as an improved query optimizer, the parallel DB2 "still doesn't offer the full capabilities of DB2/2," Leibman said. DB2/2 is the implementation for uniprocessor and symmetrical multiprocessing machines under AIX, HP-UX and other Unix operating systems. DB2 PE 1.2 sacrifices some features for the sake of parallelizing those most essential to high performance, Leibman said.

Those shortcomings are due to be remedied in the next release, Version 3.0, which hasn't been announced yet but is set to ship by July of next year, said Gilles Fecteau, the product's main architect.

Briefs

Licensing spree

NetManage, Inc. is licensing the Java programming language, with plans to embed Java inside NetManage's JetMail electronic-mail client, Forum Internet and free World Wide Web browser, WebSurfer. The Cupertino, Calif., firm is also licensing Borland International, Inc.'s AppAccelerator compiler to improve the speed and performance of Java applets in its applications.

Commence selling

Commence Corp., a maker of groupware called Workgroup Information Manager, is taking a page from Lotus Development Corp.'s channel strategy for Notes groupware and beefing up its value-added reseller support. The Shrewsbury, N.J., vendor will provide marketing support, a Web site and training to firms in an effort to expand its channel presence.

IBM to resell middleware

IBM announced plans to resell Open Horizon, Inc.'s Connection middleware, which links end users to multiple databases and transaction processing monitors. Connection will be a key piece of a single sign-on framework for distributed networks that IBM plans to announce this summer. That will enable users to log on just once and get access to multiple systems.

MEDICAL ALERT...
Avoid Nervous Stress Disorder when Moving to Unix



Stop worrying about your programming productivity in Unix! Use the mainframe-style tools you've been using for years.

uni-XEDIT cms-style Editor with Full Macro Support

uni-REXX Portable System Control and Macro Language

uni-SPF ispf-style Editor, Browse, Utilities, ... even Dialog Mgmt!

wrk/grp
The Workstation Group

800-228-0255
sales@wrkgrp.com
http://www.wrkgrp.com

Affinity

CONTINUED FROM PAGE 47

these two platforms is welcome, he added.

The announcements are part of Digital's so-called Affinity program, which was announced last year. The program is aimed at allowing corporations to connect Windows NT systems to OpenVMS systems in a three-tier client/server arrangement.

NT/OpenVMS integration

Thus far, at least, Affinity "is playing well with the VMS installed base," said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass. "VMS still remains the production system of choice," but it is becoming clear to the VMS base that NT is the "hot new technology of the future," he added.

Catch the wave

For its part, Digital plans to ride the Affinity train for as long as it can. "We are going to be establishing a pattern of monotonous predictability here" as far as announcing and delivering Affinity products are concerned, said Wes Melling, Digital's vice president of OpenVMS systems.

As part of this exercise, Digital this fall will follow up on its recent Affinity product rollout with major enhancements to application development packages, transaction processing and messaging (see chart, page 47). Among the improvements will be "dramatically increased transparency of bi-directional data access" between OpenVMS and Windows NT, according to Melling.

Next year, a new storage server will debut. It will provide a pool of centrally managed, high-availability disk and file storage for Windows NT application servers. Also on the horizon are enhancements to Open- VMS, including fiber channel and Asynchronous Transfer Mode as cluster interconnects. A Windows NT management station that provides cluster storage, batch job scheduling and console management tools is also scheduled for next year.

Other users welcomed Digital's continued rollout of its Affinity program but expressed concern that OpenVMS may be getting pushed aside in the process.

"NT could be a very useful and very dynamic operating system, but I am not certain in what way it will interact with VMS," said Brian Cutler, OpenVMS system manager at the State University of New York at Albany.

configure 2

- Multimedia
- CD-ROM
- 3 Lithium Ion Batteries
- 16-Bit Stereo Sound
- Dual Speakers
- NTSC/PAL TV Output



Can run internal diskette drive simultaneously with CD-ROM.

Dual speakers integrated into the CD base provide deep, crisp 16-bit stereo sound.

This base is detachable and houses the CD-ROM.

I want to use a CD-ROM with full-motion video. I want 3 batteries with up to 10 hours of life.

intel inside pentium

COMPAQ

A data mining tool for marketers

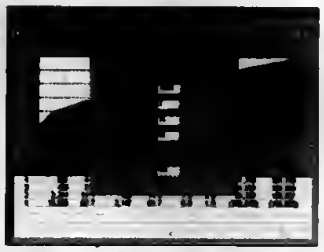
By Sharon Gaudin

Pilot Software, Inc. has wrapped its new data mining tool in technology designed to find information and make business sense of it.

"Data mining is just coming out, and Pilot's release is going to be the first to integrate a data mining tool with other business intelligence applications," said Michael Joseph, an analyst at International Data Corp. in Framingham, Mass. "That's hot stuff."

Pilot in Cambridge, Mass. — owned by The Dun & Bradstreet Corp. — is preparing to ship the Pilot Discovery Server, the data mining component to its Decision Support Suite. Discovery Server is scheduled to ship late this month.

The server is aimed specifically at sales and marketing users, not statisticians and data mining experts, according to Paul Buta, product manager at Pilot. It is touted as being able to analyze a relational database, identify groups of customers who have similar characteristics and make predictions for those groups.



Pilot Discovery Server *enables marketers to interpret results and produce models without the aid of statisticians*

"Typically, they need to extract the information from the warehouse. When they do that, they make some assumptions about what data to extract. But often those assumptions are wrong," Buta said.

Stephen Huson, a business solutions manager at Lightbridge, Inc. in Waltham, Mass., beta-tested the Discovery Server. "With Pilot's product, the marketer can actually generate models and interpret the results," he said. With most data mining tools, the information systems department has to extract data, and then a trained statistician produces a model for the marketer.

Mining the vein

Red Brick Systems, Inc. is also coming out with integrated data mining. Red Brick Data Mine, to be built in to Red Brick Warehouse Version 5.0, is expected to ship Dec. 1.

David Folger, a program director at Meta Group, Inc. in Stamford, Calif., said Pilot's strength lies in its focus on a certain class of problems — marketing and sales.

For example, Huson said he uses Discovery Server to analyze turnover in the cellular telephone industry. "Pilot tells us which customers are most likely to defect [to another company] and why. That information helps us figure out how to keep more of them."

Release 2.0 now here!

Contents News Search Help TechCity

@ COMPUTERWORLD

The Internet Connection for the IT Community

Just six months after our inaugural launch of @Computerworld, we bring you Release 2.0 of our web site. The site is now easier to access, easier to navigate, and provides a variety of services for the IT Professional. Welcome to Release 2.0 of @Computerworld.

William Brandel
Editor, @Computerworld

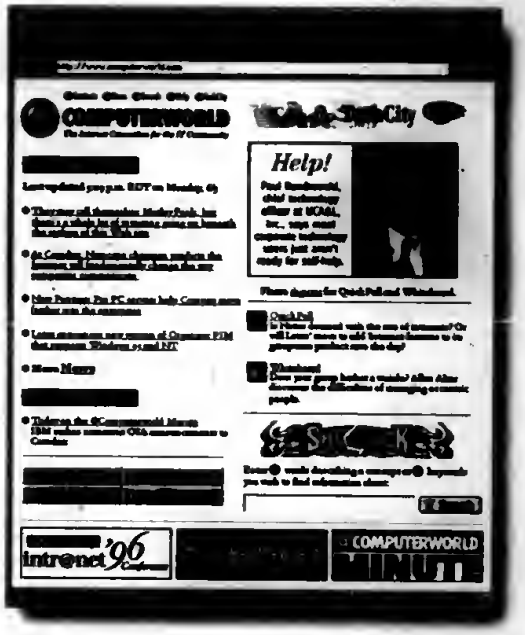
News
Computerworld's editorial staff provides you with the most comprehensive and up-to-date coverage of IT news on the World Wide Web.

Sherlock
Search our archives for timely and relevant articles from Computerworld.

QuickPoll
Cast your vote and see where you stand on the hot industry issues.

TechCity
The center for personal and commercial services for the IT professional.

Audio
No time to read? Listen to the day's news in the @Computerworld Minute. Or, get caught up on the latest management trends or gain insight into the industry with our audio profiles. Our audio can also be heard from 1 (800) 340-2262



Start Your Day @Computerworld

Your IT web address:
www.computerworld.com

INVITE TOP I.T. STUDENTS
to work for your organization in Computerworld's 1997-98 Campus Edition.

Wednesday

configure 3

Slimline

5.1 Lbs.

1.5" Thick



Memory expandable up to 48 MB.

Touchpad can be replaced by an optional trackball.

Internal diskette drive is replaced by a battery.

I travel light, real light. I don't need a floppy. And I want it all at around 5 lbs.

intel inside

pentium

COMPAQ

New Products

Logicraft Information Systems, Inc. has released FastCD Personal Edition, CD-ROM emulation software.

According to the Nashua, N.H., company, FastCD Personal Edition lets users run any Windows 95 or Windows NT CD-ROM application directly off a hard drive without a CD-ROM drive. It builds CD-ROM images by caching the entire contents of a CD-ROM in a container file on a local or network hard disk drive.

FastCD Personal Edition lets desktop users simultaneously run multiple CD-ROM applications off their local hard disk drives.

In networked environments, FastCD Personal Edition will let users access multiple CD-ROM applications off shared images stored on any file server or other PCs in peer-to-peer fashion. Users can access CD-ROM applications simultaneously.

FastCD Personal Edition costs $25.

▶ *Logicraft Information Systems*
(603) 880-0300
www.logicraft.com.

Lotus Development Corp. has introduced Organizer 97, the latest edition of the company's personal information manager for Windows. According to the Cambridge, Mass., company, Organizer 97 runs on Windows 95 and Windows NT.

It has a multiaccess, multiuser database format that lets users schedule appointments, track to-do lists, maintain address lists and manage contacts.

Organizer 97 features flexible time management tools, full OLE and text formatting capabilities in Lotus NotePad and support for telephony application programming interface dialing.

It also includes World Wide Web icons for access to Lotus' Organizer Web site, the ability to launch a Web page from the NotePad and expanded support for international addresses.

Organizer 97 is compatible with Organizer 1.x and 2.x files. It costs $79.

▶ *Lotus Development*
(617) 577-8500
www.Lotus.com

RightFax, Inc. has introduced RightFax 4.5 for OS/2 and Windows NT, high-end fax server software.

According to the Tucson, Ariz., company, RightFax 4.5 for OS/2 and NT is a multitasking, multithreaded cross-platform enterprise fax server tool that lets users send and receive faxes directly from network workstations.

It was designed to take advantage of client/server architecture and enable all functions, including conversions, record maintenance and printing services, at the fax server level.

RightFax 4.5 for OS/2 and NT can be used in a variety of different environments, including Microsoft Corp.'s Windows NT Server, Novell, Inc. NetWare, IBM LAN Server and OS/2 Warp Server.

It includes support for Microsoft's Windows 3.x, Windows 95, Windows NT Workstation, DOS, Windows for Workgroups and OS/2 Warp clients.

Pricing for RightFax 4.5 starts at $1,495 for a server license for a single channel with unlimited users.

▶ *RightFax*
(520) 327-1357

CFM, Inc. has rolled out TeamFlow 4,5, process mapping software.

According to the Bedford, Mass., company, TeamFlow 4.5 combines deployment, organizational and Gantt charts with document management features.

It lets Lotus Notes users establish one-to-one connections among TeamFlow flowchart elements and individual documents in a Notes database.

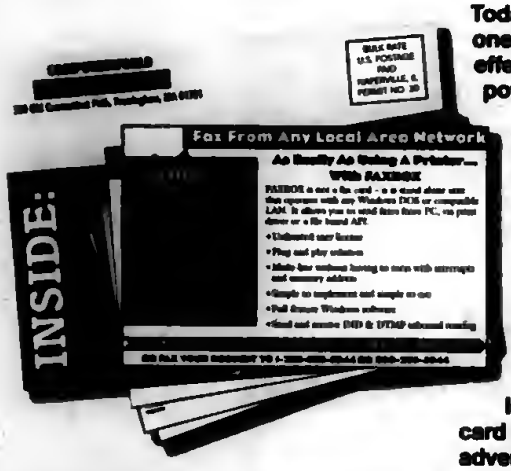
Users can access a Notes document without having to navigate through the Notes database structure.

TeamFlow 4.5 features include the ability to add text comments anywhere on the deployment flowchart to label lines, annotate work or add explanatory notes. It also allows the import and export of data between TeamFlow and spreadsheets.

TeamFlow 4.5 runs on Microsoft Corp.'s Windows 3.1, Windows 95 and Windows NT. It costs $295 for a single-user version or $1,350 for a five-user network license.

▶ *CFM*
(617) 275-5258
www.teamflow.com

The Power Tool of Direct Marketing
Card Deck Advertising



Today, direct response card decks are one of the most powerful and cost-effective ways to reach a group of potential buyers. Card decks bundle together product and service offers and are mailed directly to the desks of a highly-qualified target audience. The cards are presented in a postage-paid business reply card format so easy to respond to that they practically demand response!

Computerworld Card Decks are the perfect example of the success you can have generating leads and making sales by using card decks. Just look at what our advertisers have to say:

Cost-Effective

"With their excellent cost-per-lead, Computerworld Card Decks consistently generate the highest profits of any deck we've tried. Every time we advertise we receive well over 100 leads. Sometimes we even get responses six months later."

Mary Cooper
Vice President
cfSoftware, Inc.

Sales Success

"Month after month, quality leads and sales success show us that Computerworld Direct Response Cards are one of the most effective ways to reach more of our potential audience – faster and easier."

David Kimball
President
Telepartner International

Quality Leads in Volume

"I used to be a bit skeptical of the potential value of card deck advertising. However, after running my first ad in the Computerworld Card Deck, I quickly discovered that a lot of people do look at card decks. I was shocked by the volume of responses when the first box was delivered, the majority were from professionals with a sincere interest in my product."

Russ Teubner
President
Teubner & Associates

Best Lead Source

"In our multi-level advertising approach, card decks traditionally rank among our best lead sources. In fact, we average upwards to 750 responses for each Computerworld Direct Response Card we run."

Marty Murphy
President
Faulkner Information Services

Computerworld Card Decks give you a cost-effective way to reach Computerworld's powerful buying audience of over 143,000 computer professionals. Every month. They're working for these advertisers –and they can work for you!

To reserve your space, call Norma Tamburrino, National Accounts Director, at 800-252-4821, ext. 500 - today!

COMPUTERWORLD
CARD DECK

thursday

configure 4

- Virtual Office
- SpeedPaq 288 Telephony Modem
- Full Duplex Speakerphone*
- Answering Machine*
- Fax Machine†
- Internet Ready



Just Connect Communication Software creates a point-and-click virtual office.

Speakerphone operates via phone line or cellular phone.

The Compaq PremierSound audio system. 16-bit stereo sound in any configuration.

*Requires Compaq SpeedPaq 288 Telephony Modem, available in Summer 1996. †Requires modem

I want sound. Big, big sound. I want a full duplex speakerphone so they can hear me in Texas.

intel inside pentium

COMPAQ

New Products

Apian Software, Inc. has unveiled Survey Pro 2.0, software for generating complete, integrated business, government and medical surveys.

According to the Menlo Park, Calif., company, Survey Pro 2.0 was designed for managers, business owners and consultants and lets them create surveys, analyze data and report results. It includes features for questionnaire design, database answer entry, management analysis and reporting.

Survey Pro 2.0 also includes drag-and-drop editing, point-and-click design specifications and WYSIWYG layout tools.

Survey Pro 2.0 costs $795.

▶ *Apian Software*
(415) 694-2900
www.apian.com

BookMaker Corp. has announced Surf 'n' Print, an Internet printing application that turns standard 8.5- by 11-in. pages into 5.5- by 8.5-in. digest-size booklets.

According to the Palo Alto, Calif., company, Surf 'n' Print lets any Windows 3.1 or Windows 95 user capture and print information from any World Wide Web site. The software reduces and paginates all the information and compiles it into a center-stapled or folded booklet. It intercepts standard-size pages on the way to any laser or ink-jet printer, reduces them and rearranges them into front and back sides.

A free 10-pack of Surf 'n' Print is available through BookMaker's home page. Unlimited-use versions cost $10.

▶ *BookMaker*
(415) 354-8161
www.clickbook.com

Brooktrout Technology, Inc. has announced Show N Tel 4.0 for Windows NT.

According to the Needham, Mass., company, Show N Tel 4.0 is a Windows NT-based client/server platform for developing and deploying voice, fax and telephony applications for an enterprise. It was designed for developers of telephony applications, including interactive voice response, fax-on-demand, desktop screen-pop and fax broadcast.

Show N Tel 4.0 features ActiveX controls and remote, multinode management and administration facilities.

Pricing for Show N Tel 4.0 for Windows NT starts at $995.

▶ *Brooktrout Technology*
(617) 449-4100
www.brooktrout.com

Sheridan Software Systems, Inc. has announced Sheridan Components Suite, three ActiveX controls.

Sheridan Components Suite comprises Calendar Widgets, Designer Widgets 2.0 and Data Widgets 2.0. According to the Melville, N.Y., company, the suite gives visual developers tools for developing front ends for database applications, along with specific widget and calendar components and features.

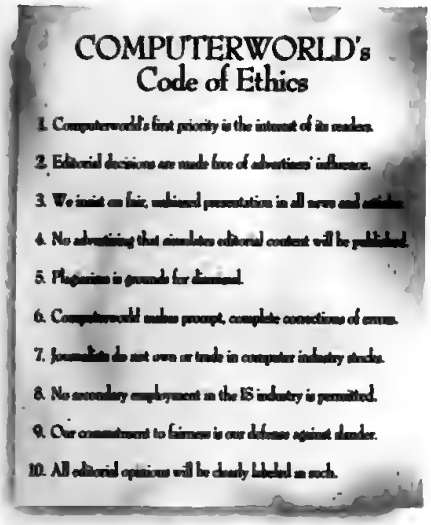
Data Widgets 2.0 includes advanced data-bound controls. Designer Widgets 2.0 features tool bar, notebook and index controls and tabs. Calendar Widgets is a set of components for visually displaying date- and time-related information in Windows-based applications.

Sheridan Components Suite costs $349.

▶ *Sheridan Software Systems*
(516) 753-0985
www.sheroft.com

Product short

Prolific, Inc. has introduced Snapshot/400 5.3, a performance tool for IBM's AS/400. It provides graphical, updated detail on many aspects of the AS/400, including CPU usage, number of users, disk utilization and average response time. Cost: starts at $995. Prolific, Arlington, Texas (817) 649-3223.





WORDS WE LIVE BY.

When you pick up a copy of *Computerworld*, you know you're getting the most objective, unbiased news and information in IS. Our code of ethics guarantees it.

Why do we make such a big deal out of editorial integrity?

Because the words you read in *Computerworld* often have a dramatic impact on your business, your career, and your future.

You use this information to evaluate new products. To get a candid view of emerging technologies. To find out the inside story on corporate strategies. To decide whether to jump ship or stay in your current job. To get the edge on your competition.

In short, *Computerworld* is filled with the words IS professionals like you live by.

WORDS YOU WORK BY.

Week in and week out, our editors and reporters call it the way they see it – on issues ranging from network management to reengineering. They dig deeply to bring you the most accurate, comprehensive news in IS.

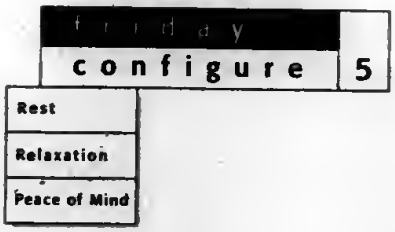
It's no wonder over 145,000 IS professionals pay to subscribe to *Computerworld*. Shouldn't you? Order today and you'll receive 51 information-packed issues. Plus, you'll get our special bonus publication, *The Premier 100*, an annual profile of the leading companies using IS technology.

Call us toll-free at **1-800-343-6474**, or visit us on the World Wide Web at http://www.computerworld.com. To order by mail, use the postage-paid subscription card bound into this issue.

You'll get the kind of straightforward, impartial reporting you can work by. You have our word on it.

COMPUTERWORLD
Everything you need to know.







What more can I say? I just want it to be *cool.* Real functional. Introducing the Compaq Armada 4100. Life should be so flexible. For more information, call 1-800-853-9521. Or visit our site at www.compaq.com.

COMPAQ

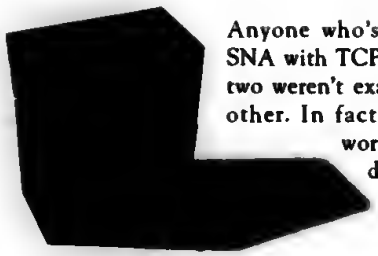
Has It Changed Your Life Yet?

intel inside
pentium® processor

©1996 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. SpeedPaq, PremierSound and Armada are trademarks of Compaq Computer Corporation. The Intel Inside Logo and Pentium are registered trademarks and the Pentium Processor Logo is a trademark of the Intel Corporation. Other products mentioned may be trademarks of their respective companies.

IF ONLY IT COULD UNITE THE REST OF THE WORLD
THE WAY IT INTEGRATES SNA AND TCP/IP.





Anyone who's tried to combine SNA with TCP/IP can tell you the two weren't exactly made for each other. In fact, getting them to work together can be a daunting challenge.

Unless you've got an expert on your side—like WRQ. We've been successfully integrating TCP/IP into diverse environments for years. And we've put that experience into Reflection® Suite for the Enterprise.

It gives you reliable, award-winning TCP/IP with a broad range of management and diagnostic features not available in other stacks, and a range of SNA connectivity options.

For a free evaluation copy, just give us a call. We're sure you'll be impressed. We'll even bet the farm on it.

For a FREE evaluation copy of any Reflection product, call toll-free
800.926.3896

REFLECTION SUITE FOR THE ENTERPRISE

***COMPREHENSIVE CONNECTIVITY*—MAINFRAME:** 802.2 DLC, COAX DFT, SNA GATEWAYS, TCP/IP (INCLUDING TN3270E); **AS/400:** MPTN, SNA GATEWAYS, NS/ROUTER (INCLUDED), CLIENT ACCESS, PC SUPPORT, TCP/IP (TN5250); **UNIX/DIGITAL:** LAT, TCP/IP, IPX/SPX, DECNET, AND OTHERS

***ENHANCED USER PRODUCTIVITY*—WINDOWS-LIKE FEATURES, REMOTE/MOBILE OPTIMIZATIONS, INTERNET/INTRANET APPLICATIONS**

***CLIENT/SERVER AND PROGRAMMABILITY*—VB-COMPATIBLE SCRIPTING LANGUAGE, OLE 2.0 AUTOMATION, SUPPORTS DDE, HLLAPI, C/C++**

***EXCEPTIONAL MANAGEABILITY*—NETWORK DIAGNOSTICS, CUSTOMIZATION, SIMPLIFIED SETUP**

***AWARD-WINNING SERVICE AND SUPPORT*—FREE, ONGOING SUPPORT VIA TELEPHONE AND ONLINE SERVICES**

WRQ REFLECTION OFFERS COMPLETE SOLUTIONS FOR UNIX, X, HP, DIGITAL, AS/400, 3270, AND TCP/IP CONNECTIVITY.

CALL 800.926.3896 IN EUROPE, CALL +31.70.375.11.00
OUTSIDE EUROPE, CALL 206.217.7100

WRQ
Makers of Reflection Software

WALKER RICHER & QUINN, INC. / 1500 DEXTER AVENUE NORTH, SEATTLE, WASHINGTON 98109 USA / FAX 206.217.0293 ▲ EUROPEAN HEADQUARTERS / FAX +31.70.354.1264 ▲ GERMAN OFFICE / FAX +49.2102.490583 ▲ FRENCH OFFICE / FAX +33.1.48.10.10.09 ▲ SE ASIAN HEADQUARTERS / FAX +65.336.3333
▲ WRQ AND REFLECTION ARE REGISTERED TRADEMARKS OF WALKER RICHER & QUINN, INC. ALL OTHER TRADEMARKS ARE THE PROPERTY OF THEIR RESPECTIVE HOLDERS

Users mixed on online buying

Many enjoy speed of the Internet but remain cautious

By Rebecca Sykes

Users' reactions to buying software over the Internet remain highly varied, according to customers at Comdex/Spring '96.

For some, there is simply no compelling reason to buy software over the Internet.

"I'm not dissatisfied with the way I get software now," which is through retailers or vendors directly, said Andrew Swiston, systems analyst at Arthur Andersen & Co. in St. Charles, Ill. "It's still just as easy to give [vendors] a call, [and] it gives you a break from staring at the computer."

But other users, including Rick Messinger, say purchasing software over the Internet is very convenient.

"You're surfing, and you find something cool, and you want to buy it, and — bing, bing, bing — there you go," said Messinger, information systems director at Compression, Inc., an Indianapolis-based maker of prototypes that range from sunglasses to fishhook removers.



Benefits of riding the wave

Messinger has bought between six and 12 applications on the Internet in the past year, all for his personal use. All the applications caught his eye while he was surfing at home. His recent purchases include several games and Internet software, such as Netscape Communications Corp.'s Navigator, Messinger said.

For other users, geography is the decisive factor, as they use the Internet to gain access to software unavailable to them through other channels.

"Most of the software I look for on the 'net is not for sale in Argentina," said Carlos Vazquez Varela, CEO of Sistemas S.R.L., a software developer in Buenos Aires. Within the past year, Vazquez Varela has bought four applications on the Internet, including a hard-to-find printing utility he needed for a Hewlett-Packard Co. machine.

And for Vazquez Varela, the Internet is where he finds out about the software in the first place. "I wouldn't have known" about the printing utility without the Internet, he said.

The Internet helps some users get around their geographic realities, but other users remain constrained. In Saudi Arabia, would-be Internet users are held at bay by two prongs of a very strong fork: the lack of a telecommunications infrastructure and the Saudi Arabian government, said Marwan Bayoumi, MIS manager at Abudawood for Industry, a Jeddah-based maker of bleach.

Bayoumi hasn't bought software over the Internet because it is too expensive. There is no number for dialing in to the Internet from within Saudi Arabia, Bayoumi said. Instead, users must place a call to another country to obtain "call-back" service, which lets them surf the World Wide Web from lines within that country, Bayoumi said.

The cost is around $3 per minute, which is only the beginning of the charges incurred by making purchases over the 'net, he said.

Instead of using the Internet, Bayoumi relies on his relationship with Clorox Co. in Oakland, Calif. — to which his company sells its bleach — to get access to some software, including Windows 95, Windows NT and Lotus Notes, he said.

Careful and concise

Several users who purchased software over the Internet said they did so cautiously and with a particular strategy in mind.

Messinger chose to make his purchases in stages.

"I'd buy something and watch my [credit-card] statements and make sure nothing [bad] was happening," Messinger said.

Security concerns are a large part of the reason Swiston doesn't purchase software via the Internet. "It still doesn't feel real secure," he said, noting the warning messages that accompany many transactions on the 'net.

But others, including Vazquez Varela, purchase software over the Internet despite their misgivings about security.

"The first time I did it, I closed my eyes," Vazquez Varela said. "Nothing [bad] happened, so I did it again."

Sykes writes for the IDG News Service.

NT vies for role

CONTINUED FROM PAGE 47

want to get the job done quickly, effectively and cheaply. It's no longer a religious decision; it's a business decision."

But the Macintosh is a tough act to follow. Macintoshes currently offer more built-in functionality — including onboard audiovisual processors, video output and video digitizing hardware — than their Intel-based counterparts, said Dan White, senior product manager for Avid Technology's NT products.

Strong competition

In addition, Apple Computer, Inc. offers a line of audiovisual Power Macintoshes that include built-in digital-to-analog converters. The Mac OS also simplifies video integration with QuickTime, a system-level technology that provides a standard interface for dealing with video hardware and software across Macintoshes and Windows.

Video editing

Observers said the Macintosh's history in creative markets means there is a slew of third-party software for video editing, authoring and special effects.

Although some of those applications are also for Windows, Turner said he expects more video tools to be available for NT in the next year. He predicted that corporate users who already embrace NT will start demanding video-related features to incorporate video into presentations, memos and electronic mail that can be distributed over networks.

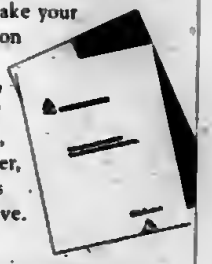
Brief

Tools support Active/X

PostModern Computing Technologies Inc. in Mountain View, Calif., said the next versions of its Cybelius and BlackWidow object middleware products will support ActiveX, Microsoft Corp.'s architecture for Internet applications. The releases, which will ship in July, will let developers write distributed object applications using Microsoft's Visual Basic or Visual C++, as well as Java, Sun Microsystems, Inc.'s Internet development language. Cybelius, which runs on Windows 3.1, Windows 95, Windows NT and Unix, starts at $2,980. The Java-based BlackWidow runs on Windows 95, NT and Unix. Pricing starts at $5,000.

HOW TO MIGRATE FROM SNA TO TCP/IP. AS QUICK AS A FOX.

Our free white paper, "Moving From SNA To TCP/IP? Here Are Some Pitfalls To Watch For," can help make your transition from SNA to TCP/IP quicker, smoother, and less expensive.



Call 800.926.3896, ext. 4211, or visit our Web page at http://www.wrq.com today for your free copy.

For more information on integrating TCP/IP, or a free evaluation copy of Reflection® Suite for the Enterprise call

800.926.3896

(ext. 4211)

http://www.wrq.com

WRQ

Makers of Reflection Software



#1
in FDDI Switching for revenue and ports worldwide–Dell'Oro Group

#1
in Remote Access Server ports shipped–IDC

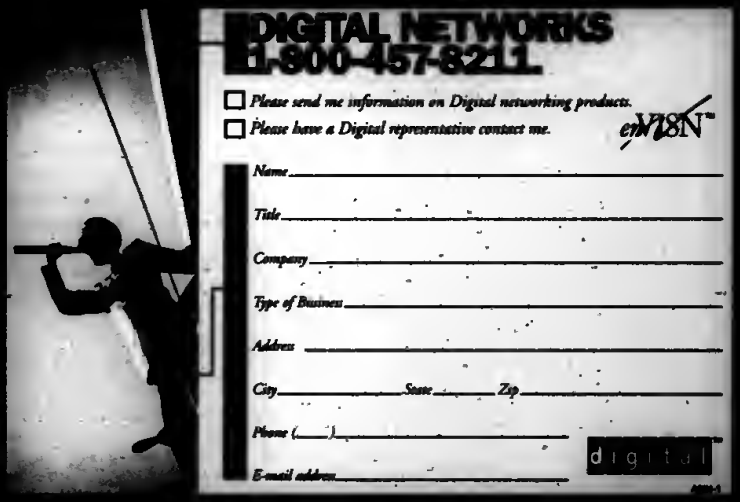
#2
in Ethernet LAN Switching ports worldwide–Dataquest

#2
in FDDI Hub revenue and ports–IDC

#3
in LAN Switching revenue worldwide–IDC

enVISN™

Enterprise Virtual Intelligent Switched Networks: Digital's comprehensive road map from wherever you are now to the virtual networking of the future.



DIGITAL NETWORKS
1-800-457-8211

☐ Please send me information on Digital networking products.
☐ Please have a Digital representative contact me.

enVISN™

Name _____

Title _____

Company _____

Type of Business _____

Address _____

City _____ State _____ Zip _____

Phone (___) _____

E-mail address _____

digital™


NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES
BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO 79 WESTFORD MA
POSTAGE WILL BE PAID BY ADDRESSEE
digital™
DIGITAL EQUIPMENT CORPORATION
PO BOX 687
WESTFORD MA 01886-9902

THE HUBS, ROUTERS AND SWITCHES ARE FOR SALE. THE VISION WE'LL THROW IN FOR FREE.

Navigating your network into an uncertain future is no job for the short-sighted. Which means it's the ideal job for Digital. From routers to enterprise switches to advanced management software, Digital solutions are uniquely flexible. They support Ethernet, Fast Ethernet, Token Ring, FDDI, ATM—and whatever comes after. And they're effortlessly scalable—from today's desktop LAN to tomorrow's worldwide DIGITAL NETWORKS *enterprise. No wonder Digital ranks in the top tier of network suppliers, all over the world. If Digital's quality, reliability and vision have earned a place in so many networks, ask yourself: Shouldn't you be looking at Digital? For more information, call your Digital Business Partner or* **1-800-457-8211.**

digital™
WHATEVER IT TAKES™

Or set your browser for **www.networks.digital.com.**

©1996 Digital Equipment Corporation. Digital, the DIGITAL logo and the exVISN logo are trademarks and Whatever it Takes is a service mark of Digital Equipment Corp. All other products are trademarks or registered trademarks of their respective companies.

WHEN YOU DECIDE ON A NETWORK MIGRATION SOLUTION ...

CHOOSE A COMBINATION THAT WON'T SLOW YOU DOWN.



ANIXTER

1-800-ANIXTER



William Jewell College picks ATM for long-range needs, 68

The Enterprise Network

Merger mania hits home

By Bob Wallace

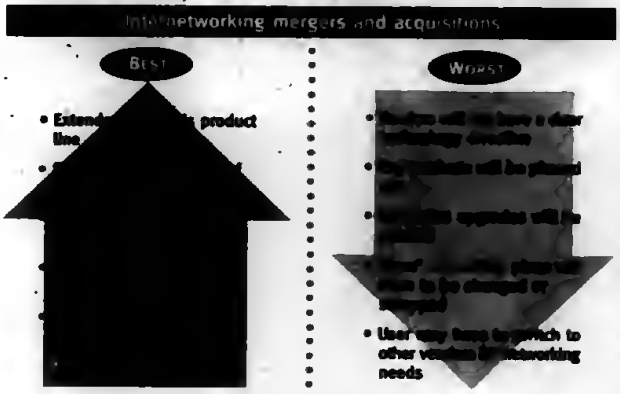
They are still concerned about the fast pace of mergers and acquisitions in the frenzied internetworking industry, but users like the end result — more complete and tightly integrated product lines.

"The best end result of a merger or acquisition is when a company can quickly extend, or plug a major hole in, their product line with minimal disruption to users," said Blair Sanders, a senior member of the technical staff at Texas Instruments, Inc. in Plano, Texas.

That means users can get new and innovative products that don't require costly upgrades, are interoperable and are backed by solid service and support, Sanders said.

The number and median size of mergers and acquisitions in the internetworking industry has risen from 17 mergers worth $8.6 million in 1992 to 30 mergers worth $48.8 million last year.

Cisco Systems, Inc. is leading internetworking's Big Four, with nine mergers and acquisitions to date. A 10th, StrataCom, Inc., is due to be approved soon. 3Com Corp. is second on the acquisition trail, and Bay Networks, Inc. — which was itself formed by a merger — is third.



Even the acquisition-averse Cabletron Systems, Inc., which hadn't bought anything heading into this year, earlier acquired the switching division of Standard Microsystems Corp. and has announced plans for second and third buyouts. It will fork out more than $250 million for a remote access vendor and an adapter card vendor.

Not always welcome

Mergers and acquisitions often wreak havoc on users' networking plans.

"They put a tremendous amount of pressure on IS managers by continually forcing them to look at the potential resulting products and determine what they could do to existing network plans," said Bill Horst, chief at the General Services Administration's communications branch in Philadelphia.

Horst said information systems managers should gather as much information as they can on a merger, get the vendors to disclose the financial details, find out what product lines will be saved and/or cut and determine if any upgrades will be required. "The goal is to have them tell you if and how they think the deal might impact your networking plans," he said.

The best-case scenario is when a user firm does business with each of two companies that merge, according to one large user.

"We felt very comfortable when SynOptics and Wellfleet decided to merge, largely because that means we'd see integration of routing and hubbing technology and in part because we'd have one less large company to deal with," explained Bob Spahn, a telecommunications specialist at Entergy Services, Inc. in Gretna, La.

Like many users, Entergy, the nation's fourth-largest electric utility, uses Wellfleet Communications, Inc. routers and SynOptics Communications, Inc. hubs. Bay showed a lot of foresight by acquiring network monitoring power Armon Networks, Inc. this year in a move that expanded its overall product line, Spahn added.

Don't rule it out

Sanders had some suggestions for companies that are reticent about mergers and acquisitions.

"Vendors need to avoid the 'it's got to be invented here or it's no good' approach and look at every opportunity," Sanders said. "I think most vendors realize that developing products in areas they're not experienced in can take too much time, effort and money."

The upcoming release of OS/2 Warp will have Assistance Center, a utility that includes the following modules:

- Contains artificial intelligence. Provides appropriate level of support – from beginner to advanced – for many tasks.
- Allows IBM service representatives to troubleshoot by dialing in to users' systems.
- An expert systems-based tool that contains a database of frequently asked questions.
- Tools for LAN administrators to monitor network and processor performance.

OS/2 gets symmetrical

Merlin to feature network management, four-way SMP

By Laura DiDio

IBM will add network management features and multiprocessing support to the next version of its OS/2 Warp operating system.

The four-way symmetrical multiprocessing (SMP) support would boost OS/2's speed by 200% to 300% compared with OS/2 2.11, IBM executives said at the recent Comdex/Spring '96.

The standard SMP support will let OS/2 Warp users parcel out processing among two to four servers. Users will also be able to buy optional support for four more processors — for maximum SMP support for up to eight processors. This equals the support from rival

OS/2, page 71

Web gives facelift to network management

By Patrick Dryden

Management tools

The World Wide Web is changing the face of software for managing distributed networks, systems and applications. Next quarter, users should see reusable, mix-and-match modules that can spread the management workload throughout a network and that won't require vendor-specific interfaces.

As a first step, many administrators and vendors are broadening access to management information by using Hypertext Markup Language to post reports on Web servers. That would let operations staff, field supporters and even users monitor status or performance of any machine with a browser instead of the Unix client/console typically required by a specific tool.

Network managers have experimented with ways that they can post trend reports on intranets at Chevron Information Technology Co. in San Ramon, Calif., and Sprint Corp. in Westwood, Kan. But they said they seek more — a standard way to manage devices from a browser.

"Java looks like the way to go," said T. X. Ho, senior communica-

Web, page 68



"Funny,
I thought my
job description
said
MIS manager
not

test pilot."



Uh-oh. It's time to start designing a client/server network. All in the line of duty, of course. The trick is to do it somehow without risking your life.

The problem can be summed up in a few words. Words like "danger." And "why me?"

Wouldn't it be nice if you could see exactly how things were going to work before rocketing headlong into a sky full of question marks?

That's what we thought.

At IBM, we've spent years helping a wide variety of companies find an even wider variety of client/server solutions. Recently, we took what we've learned over those years, the accumulated wealth of knowledge, solutions, ideas, inspirations and innovations, and published them on a Lotus Notes® database.

We call it the IBM Client/Server Advisor System™, and it puts a vast reservoir of knowledge within easy reach. So whether you have to design a system for sales and marketing, human resources, manufacturing or finance, you can start from a point of knowledge and experience. Together, we can devise a solution for your business by looking at the ways in which other businesses satisfied similar needs.

Of course, simply having a solution isn't exactly the same as having a solution that works for you. So we created Open Systems Centers (there are 42 of them around the world). There, we can get more specific, design a tailored solution and test it in a real-life multivendor environment. So you'll see just how it will work in your company.

All of which means you can spend less time worrying about the risks and start focusing on the opportunities. To find out more, visit www.ibm.com or call 1 800 IBM-7080, ext. G130, for a free 16-page booklet.

Then sigh with relief.

Solutions for a small planet™ IBM®

* IBM, IBM Client Server Advisor System and Solutions for a small planet are trademarks of IBM Corp. Lotus Notes is a registered trademark of Lotus Devel. Corp. ©1996 IBM Corp.

William Jewell gives ATM the college try

By Kim Girard

When William Jewell College in Liberty, Mo., began planning a network upgrade in 1994, the networking staff weighed the options: upgrading to Fast Ethernet or taking a complete turn to ATM.

Though it meant learning a new technology, the college picked Asynchronous Transfer Mode (ATM), a scalable high-speed packet-switching technology that transmits variable-size frames of data.

ATM's huge 155M bit/sec bandwidth capacity will be tapped to let students sit in on classes while they are studying abroad or to check in with teachers via video while doing an internship in Washington, for example. With ATM, the college can run multiple video applications at once without slowing down the network, said Larry Dickerson, director of the college's computer services and networking.

But for Dickerson the decision to implement ATM has not come without doubts. For one, Fast Ethernet would have been a cheaper, easier upgrade and is now a much more mainstream technology.

> "I wanted to have a high enough transmission medium for five years down the road."
>
> *Larry Dickerson, William Jewell College*

"A lot of companies are starting to build Fast Ethernet hubs," he said. "In retrospect, Fast Ethernet would have seemed more of the option to go with."

But overall, both Dickerson and network manager Doug Hawley agreed that for the college's burgeoning video and distance learning needs, an ATM backbone was the better long-term choice. The goal is to connect a 1,700-node network encompassing all major campus buildings. All students will eventually have the capability to connect to the network from dorm rooms, Hawley said.

"I wanted to have a high enough speed transmission medium for five years down the road," Dickerson said. "I wanted video and high-capacity graphics transfer."

"Fast Ethernet is cheaper, but ATM is very hot," Hawley added. "We're looking to be in a position there so we can take advantage of wide-area connections."



William Jewel College chose an ATM network to:

- Move traffic on the LAN or WAN
- Get 155M bit/sec. performance
- Transfer voice, video and data over a single line

For the large-scale video needs often demanded in a college environment, ATM is definitely better than Fast Ethernet, said Beth Gage, a broadband consultant at TeleChoice, Inc. in Verona, N.J. Others have yet to be sold on the technology.

"The reason ATM is not thriving [overall] is there's just not a whole lot of use for it in the corporate arena yet," Gage said. "Corporate users don't want to go through the learning curve. They're doing frame relay. Someone needs to offer business solutions using ATM and show them how they can use the same infrastructure while gaining economies of scale."

William Jewell's existing network uses UB Networks' GeoStax stackable hubs and GeoRim Ethernet switches. The college is migrating to an ATM-based collapsed backbone using UB Networks' ATM switch, GeoSwitch/155, which provides dedicated 155M bit/sec. connectivity to each ATM-connected desktop or server.

Web gives facelift to network management

CONTINUED FROM PAGE 65

tions engineer at Chevron. "It promises a common interface across platforms so people can get and change information quickly and easily."

Ho and other network managers will get these kinds of wares from more than a dozen vendors that pledged recently to build applets based on the Java Management application programming interface (API).

SunSoft, Inc. officials said the company plans to offer the API and Java tools this fall in a kit called Solstice WorkShop and then provide applets next year for remote interaction with all its management software.

Officials at other vendors pledged to deliver applets as soon as the third quarter.

With such a cohesive environment for tools in place, administrators will get the data integration that vendors haven't been able to achieve through the Simple Network Management Protocol (SNMP), said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

"The Web will be the integrator for all the tools," McConnell said. "The time of the SNMP platforms is past."

Stunted growth

SNMP platforms, such as OpenView from Hewlett-Packard Co., never evolved into their intended role as the unifier of all tools. "You won't need a common data repository because the applets will get the data and put it together for you," McConnell said.

As a result, SNMP platforms will become much less important, though still needed for discovering network devices and managing events, McConnell predicted.

The Java API will spur more vendors to ship devices and systems with management objects that other vendors can use, said Peter Norwood, strategy director at the Tivoli management division of IBM.

That means enterprise management vendors won't have to develop interfaces to work with specific elements, such as a router, hub or database, Norwood said. They can just invoke the Java Management API to apply their policies to configure hundreds or thousands of targets.

"In the old way of thinking, the management console was a platform-specific way of looking at a management database. Now the browser user interface gets information from distributed objects everywhere," Norwood said.

Eventually, vendors may not have to supply consoles at all, said Blair Sanders, senior member of the technical staff for managing the global network at Texas Instruments, Inc. in Dallas.

"Then we can do everything through Web browsers instead of client consoles and X Windows sessions," Sanders said. "Each management server will become a black box in the background for CPU-intensive activity like event correlation and network mapping, while the interactive functions would move to applets."

Management applets

Pros

Power: Java programming language enables more remote interaction than text-oriented HTML

Flexibility: Applets can run on any platform, and they allow custom reporting

Support: Standard interface eases interoperability

Cons

Complexity: In-house developers must master another language, and network managers must support another management standard

Overhead: Extending management to browsers can boost network traffic and server utilization

Security: Authentication required to limit applets' ability to affect key business systems

Briefs

Candle shines on MQSeries

Candle Corp. this summer plans to expand its management software for IBM's MQSeries messaging middleware by adding support for the AIX and OS/2 versions. Candle Command Center for MQSeries now supports only the mainframe release. Agents for the Windows NT and HP-UX versions of MQSeries are also due by year's end. The Santa Monica, Calif., company also plans to start reselling MQSeries.

HP probes WANs

Hewlett-Packard Co. has adapted its NetMetrix LAN monitoring tools to help managers of wide-area networks examine the performance of their internetwork links. The NetMetrix WAN line includes probe devices that can watch traffic across frame-relay, packet-switched and point-to-point router connections. Prices range from $3,300 to $7,200, depending upon speed and number of circuits. The monitoring and reporting software runs on Windows 95 or Windows NT and costs $4,995. It integrates with HP's OpenView and other network management platforms.

Ascend switches up

Ascend Communications, Inc. in Alameda, Calif., has expanded its Max WAN switch product line. The line now includes two high-end products, the Max 4002 and Max 4004. The new switches let users choose the options needed initially and then add options later as necessary. The Max 4002, with two or four T1/PRI ports that support up to 48 analog/digital sessions, will cost $11,000, and the Max 4004, with four T1/PRI ports that support up to 96 analog/digital sessions, will cost $15,500.

Semaphore signals

Semaphore Communications Corp., a Xerox-supported venture, has released tools to prevent eavesdroppers from sampling LAN data sent across WANs via frame-relay links. Network Security System for Frame Relay provides five centrally managed services, including data integrity and data confidentiality. A hardware-based encryption engine supports major public key and private key algorithms and can transmit encrypted data at speeds up to 2.048M bit/sec., according to the Santa Clara, Calif., company.

William Jewell gives ATM the college try

By Kim Girard

When William Jewell College in Liberty, Mo., began planning a network upgrade in 1994, the networking staff weighed the options: upgrading to Fast Ethernet or taking a complete turn to ATM.

Though it meant learning a new technology, the college picked Asynchronous Transfer Mode (ATM), a scalable high-speed packet-switching technology that transmits variable-size frames of data.

ATM's huge 155M bit/sec. bandwidth capacity will be tapped to let students sit in on classes while they are studying abroad or to check in with teachers via video while doing an internship in Washington, for example. With ATM, the college can run multiple video applications at once without slowing down the network, said Larry Dickerson, director of the college's computer services and networking.

But for Dickerson, the decision to implement ATM has not come without doubts. For one, Fast Ethernet would have been a cheaper, easier upgrade and is now a much more mainstream technology.

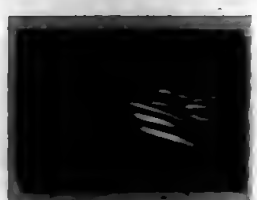
> "I wanted to have a high enough transmission medium for five years down the road."
>
> *Larry Dickerson, William Jewell College*

"A lot of companies are starting to build Fast Ethernet hubs," he said. "In retrospect, Fast Ethernet would have seemed more of the option to go with."

But overall, both Dickerson and network manager Doug Hawley agreed that for the college's burgeoning video and distance learning needs, so ATM backbone was the better long-term choice. The goal is to connect a 1,700-node network encompassing all major campus buildings. All students will eventually have the capability to connect to the network from dorm rooms, Hawley said.

"I wanted to have a high enough speed transmission medium for five years down the road," Dickerson said. "I wanted video and high-capacity graphics transfer."

"Fast Ethernet is cheaper, but ATM is very hot," Hawley added.



William Jewell College chose an ATM network for:

- Move traffic on the LAN or WAN
- Get 155M bit/sec. performance
- Transfer voice, video and data over a single line

"We're looking to be in a position there so we can take advantage of wide-area connections."

For the large-scale video needs often demanded in a college environment, ATM is definitely better than Fast Ethernet, said Beth Gage, a broadband consultant at TeleChoice, Inc. in Verona, N.J. Others have yet to be sold on the technology.

"The reason ATM is not thriving [overall] is there's just not a whole lot of use for it in the corporate arena yet," Gage said. "Corporate users don't want to go through the learning curve. They're doing frame relay. Someone needs to offer business solutions using ATM and show them how they can use the same infrastructure while gaining economies of scale."

William Jewell's existing network uses UB Networks' GeoStax stackable hubs and GeoRim Ethernet switches. The college is migrating to an ATM-based collapsed backbone using UB Networks' ATM switch, GeoSwitch/155, which provides dedicated 155M bit/sec. connectivity to each ATM-connected desktop or server.

Web gives facelift to network management

CONTINUED FROM PAGE 65

tions engineer at Chevron. "It promises a common interface across platforms so people can get and change information quickly and easily."

Ho and other network managers will get these kinds of wares from more than a dozen vendors that pledged recently to build applets based on the Java Management application programming interface (API).

SunSoft, Inc. officials said the company plans to offer the API and Java tools this fall in a kit called Solstice WorkShop and then provide applets next year for remote interaction with all its management software.

Officials at other vendors pledged to deliver applets as soon as the third quarter.

With such a cohesive environment for tools in place, administrators will get the data integration that vendors haven't been able to achieve through the Simple Network Management Protocol (SNMP), said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

"The Web will be the integrator for all the tools," McConnell said. "The time of the SNMP platforms is past."

Stunted growth

SNMP platforms, such as OpenView from Hewlett-Packard Co., never evolved into their intended role as the unifier of all tools. "You won't need a common data repository because the applets will get the data and put it together for you," McConnell said.

As a result, SNMP platforms will become much less important, though still needed for discovering network devices and managing events, McConnell predicted.

The Java API will spur more vendors to ship devices and systems with management objects that other vendors can use, said Peter Norwood, strategy director at the Tivoli management division of IBM.

That means enterprise management vendors won't have to develop interfaces to work with specific elements, such as a router, hub or database, Norwood said. They can just invoke the Java Management API to apply their policies to configure hundreds or thousands of targets.

"In the old way of thinking, the management console was a platform-specific way of looking at a management database. Now the browser user interface gets information from distributed objects everywhere," Norwood said.

Eventually, vendors may not have to supply consoles at all, said Blair Sanders, senior member of the technical staff for managing the global network at Texas Instruments, Inc. in Dallas.

"Then we can do everything through Web browsers instead of client consoles and X Windows sessions," Sanders said. "Each management server will become a black box in the background for CPU-intensive activity like event correlation and network mapping, while the interactive functions would move to applets."

[redacted]

Pros

[redacted]

Cons

[redacted]

Briefs

Candle shines on MQSeries

Candle Corp. this summer plans to expand its management software for IBM's MQSeries messaging middleware by adding support for the AIX and OS/2 versions. Candle Command Center for MQSeries now supports only the mainframe release. Agents for the Windows NT and HP-UX versions of MQSeries are also due by year's end. The Santa Monica, Calif., company also plans to start reselling MQSeries.

HP probes WANs

Hewlett-Packard Co. has adapted its NetMetrix LAN monitoring tools to help managers of wide-area networks examine the performance of their internetwork links. The NetMetrix WAN line includes probe devices that can watch traffic across frame-relay, packet-switched and point-to-point router connections. Prices range from $3,200 to $7,200, depending upon speed and number of circuits. The monitoring and reporting software runs on Windows 95 or Windows [illegible] costs $1,595. It integrates with HP's OpenView [illegible] management platform.

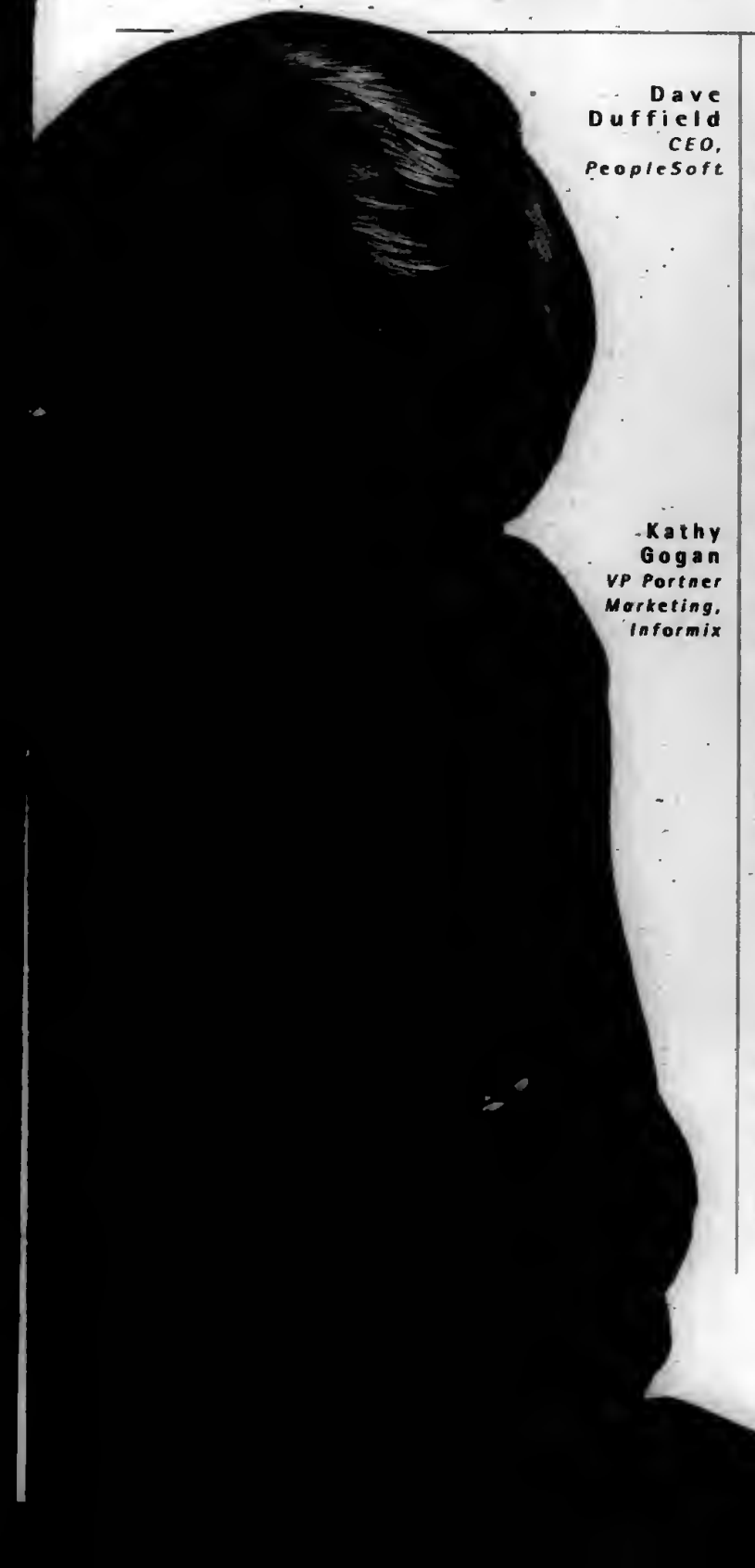
Accord switches up

Accord Communications, Inc. in Alameda, Calif., has expanded its Max WAN switch product line. The line now includes two high-end products, the Max 4002 and Max 4004. The new switches let users choose the options needed initially and then add options later as necessary. The Max 4002, with two or four T1/PRI ports that support up to 48 analog/digital extensions, will cost $11,000, and the Max 4004, with four T1/PRI ports that support up to 96 analog/digital extensions, will cost $15,500.

Semaphore signals

Semaphore Communications Corp., a Xerox-supported venture, has released tools to prevent eavesdroppers from sampling LAN data sent across WANs via frame-relay links. Network Security System for Frame Relay provides for centrally managed services, including data [illegible] authentication, [illegible] and [illegible] encryption. [illegible] company.

PeopleSoft's Dave Duffield, on Informix.



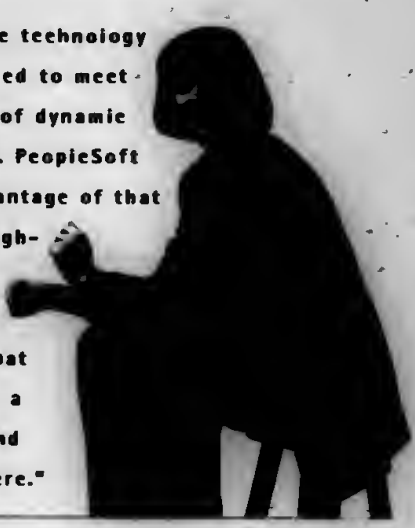
Dave Duffield
CEO, PeopleSoft

"As a worldwide provider of client/server business applications, we depend on powerful database technology that enables our applications to meet our customers' needs.

That's why we partner with Informix. Their leading technology and commitment to customer success fit perfectly with our own philosophy. Together, we help our customers manage a constantly evolving enterprise."

Kathy Gogan
VP Partner Marketing, Informix

"Our database technology was architected to meet the demands of dynamic organizations. PeopleSoft is taking advantage of that by building high-performance, highly-scalable applications that put customers a step ahead, and keep them there."



At Informix, we deliver innovative database technology for a growing number of industry leaders worldwide. By teaming with companies who share our vision, we provide our customers with the solutions they need to stay ahead of change, make the most of emerging opportunities, and gain a competitive edge in business.

INFORMIX®

www.informix.com

© 1996 Informix Software, Inc. The following is a worldwide trademark of Informix Software, Inc. or its subsidiaries, registered in the United States as indicated by ®, and in numerous other countries worldwide: Informix. All other companies and product names may be trademarks of their respective owners.

Powerful Relationships Begin With Strong Family Values.

Trust the company that invented the intelligent hub and Virtual Network Architecture (VNA™) to bring you the industry's hottest products and services.

The GeoLAN/500 is the perfect example of our innovative, reliable product family, delivering the most modular, scalable and high-performance solutions available. And nothing matches the ease of use and unique design of our powerful family of GeoSwitch/155, GeoRim/E and GeoStax networking products. Working separately or together with our performance-enhancing graphical NetDirector® network management solution, UB Networks products help you meet even the most challenging current and future networking needs. And we have an industry-leading global service and support organization to ensure your solution's success.

Call us today for your high-performance Networking Kit, and discover what a powerful difference our family values can make.

FREE
1-800-777 4LAN

http://www.ub.com

UB Networks

World Headquarters: UB Networks, 3999 Freedom Circle, Santa Clara, CA 95054, USA. + (408) 496-0111 or fax + (408) 970-7337. ©1998 Ungermann-Bass Networks, Inc. NetDirector is a registered trademark and UB Networks, the UB Networks logo, VNA, GeoLAN, GeoRim, GeoSwitch, and GeoStax are trademarks of Ungermann-Bass Networks, Inc. NonStop is a registered trademark of Tandem Computers Incorporated in the USA and other countries. All other trademarks are owned by their respective companies.

OS/2 gets symmetrical

CONTINUED FROM PAGE 65

Microsoft Corp.'s Windows NT Server platform.

The improvements — for both the server and workstation versions of OS/2 Warp — are due in the second half, the IBM executives said. Pricing hasn't been set yet.

Numbers game

OS/2 has an installed base of 730,000 servers, according to Forrester Research statistics.

OS/2 user Ray Pratts, senior technical analyst at Variable Annuity Life Insurance Co. in Houston, said the new tools are "vital. Anything that simplifies my management tasks and saves me time is a real boon."

Pratts said SMP support for OS/2 Warp Server is also crucial. "SMP will let us attach more clients to each server. That makes for more efficient and quicker network management, which will cut my workload immensely" because it will eliminate the need to manage so many individual clients, Pratts said.

Answering the NT challenge

Analysts said the features are part of an ongoing IBM initiative to jump-start momentum for OS/2 in the face of soaring demand for Windows NT Server and Windows NT Workstation software.

IBM shipped 6 million copies of OS/2 Warp last year and will ship roughly 8 million copies of OS/2 Warp this year, a spokesman said.

But Windows 95 and NT are the only operating systems that will gain market share this year, according to Dataquest, a market research firm in San Jose, Calif. Windows NT Workstation is expected to ship 8 million units this year, and nearly 63 million copies of Win 95 will ship, Dataquest said.

Nevertheless, IBM continues to add enhancements to OS/2 Warp. One new network management utility is the Assistance Center. Through its graphical user interface, the Assistance Center helps walk even nontechnical users through tasks such as configuring and installing printers and applications, said Jeff Howard, IBM's OS/2 Worldwide brand manager (see chart, page 65).

Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston, said the Assistance Center is a good idea. Centralizing key functions such as remote technical support and the WarpGuide assistant in a single utility eliminates many of the "hunting expeditions" users engage in when they search the desktop for support utilities, Sakakeeny said.

Some analysts, however, said IBM will be hard-pressed to keep pace with Windows NT's momentum.

"Warp Server's new and improved technology is great," said Jon Oltsik, an analyst at Forrester Research, Inc. in Cambridge, Mass. "But it won't change the market realities: NT is on a roll."

New Products

Ipswitch, Inc. has announced WhatsUp, a personal network monitoring product.

According to the Lexington, Mass., company, WhatsUp lets network administrators, World Wide Web administrators and Internet service providers monitor any networked device on the Internet, corporate intranet or TCP/IP LAN. When a connection fails, the administrator receives an immediate alert via a desktop alarm, a pager or electronic mail.

WhatsUp can be configured to monitor multiple devices and was designed to check the status of any server, hub, router, printer or desktop computer with an IP address. It runs on Windows 95 or Windows NT.

Pricing for WhatsUp starts at $145.

▶ *Ipswitch*
(617) 676-5700
www.ipswitch.com

Secure Computing Corp. has announced BorderWare 4.0, a suite of third-generation firewalls.

According to the St. Paul, Minn., company, BorderWare 4.0 is a turnkey, plug-and-play firewall and Internet gateway system in a single chassis. It features advanced Virtual Private Network security, Secure Server Network enhancements and World Wide Web-based remote management functions.

BorderWare 4.0 includes comprehensive auditing and logging capabilities and dual-authentication functions.

Pricing for BorderWare 4.0 starts at $4,000.

▶ *Secure Computing*
(612) 628-2700
www.sctc.com

Micro Computer Systems, Inc. has announced Inetix Client for Windows 95 and Windows NT.

According to the Irving, Texas, company, Inetix Client allows Novell, Inc. NetWare IPX/SPX clients to run 32-bit TCP Winsock applications without needing TCP/IP protocols on the client computers. It runs over Windows 95 and Windows NT IPX/SPX protocol stacks.

Pricing for Inetix Client starts at $995.

▶ *Micro Computer Systems*
(214) 659-1514
www.mcsdallas.com

LAN Innovations, Inc. has introduced Analyzer Companion 2.0, a Windows-based LAN analysis reporting tool that creates reports from a network analyzer's capture files.

According to the Colorado Springs company, Analyzer Companion 2.0 lets network administrators view packet data from within a capture file in graphic report form.

The product produces router reports, error reports, node reports and segment trend reports. Pricing starts at $595.

▶ *LAN Innovations*
(719) 575-0288

Product shorts

Cubix Corp. has introduced WorldDesk Commuter, a remote node alliance designed to serve as password authentication protocol and challenge authentication protocol security servers for Novell, Inc. and Microsoft Corp. networks. Its failure recovery feature reconnects and resumes interrupted or dropped sessions and picks up interrupted file transfers automatically. Pricing starts at $1,995 for six ports. Cubix, Carson City, Nev. (702) 888-1000. ... **SolCom Systems, Inc.** has rolled out 4-Port Ethernet Probe, a tool that lets network managers with multiple Ethernet segments in a single location manage up to four segments simultaneously. Price: $7,900. SolCom Systems, Reston, Va. (703) 758-6722.

FIELD & SALES FORCE AUTOMATION CONFERENCE

SEPTEMBER 10-12, 1996 • BOSTON, MA



Automating your sales force gives you a significant advantage over your competitors by greatly enhancing your business, increasing your sales and productivity and improving your customer management methods.

[redacted]

SFA - Reviewed by Notes - Sponsored by Lotus Development Corporation

Harvey Mackay - Best-Selling Author & Motivational Speaker - Exclusive Boston Appearance!

The Sales Advantage - In-Depth Seminars Sponsored by Dale Carnegie

Sales Automation Training Workshops - Sponsored by Learning International and Tech Resource Group

[redacted]

Robert Miller
Founder, Miller-Heiman, Inc.

Jeff Papows
Executive Vice President & COO, Lotus Development Corp.

Tom Siebel
President & CEO, Siebel Systems

Alston Gardner
CEO, Target Marketing Systems, Inc.

George Colombo
Author, *Sales Force Automation*

Jim Holden
President, Holden Corporation

[redacted]

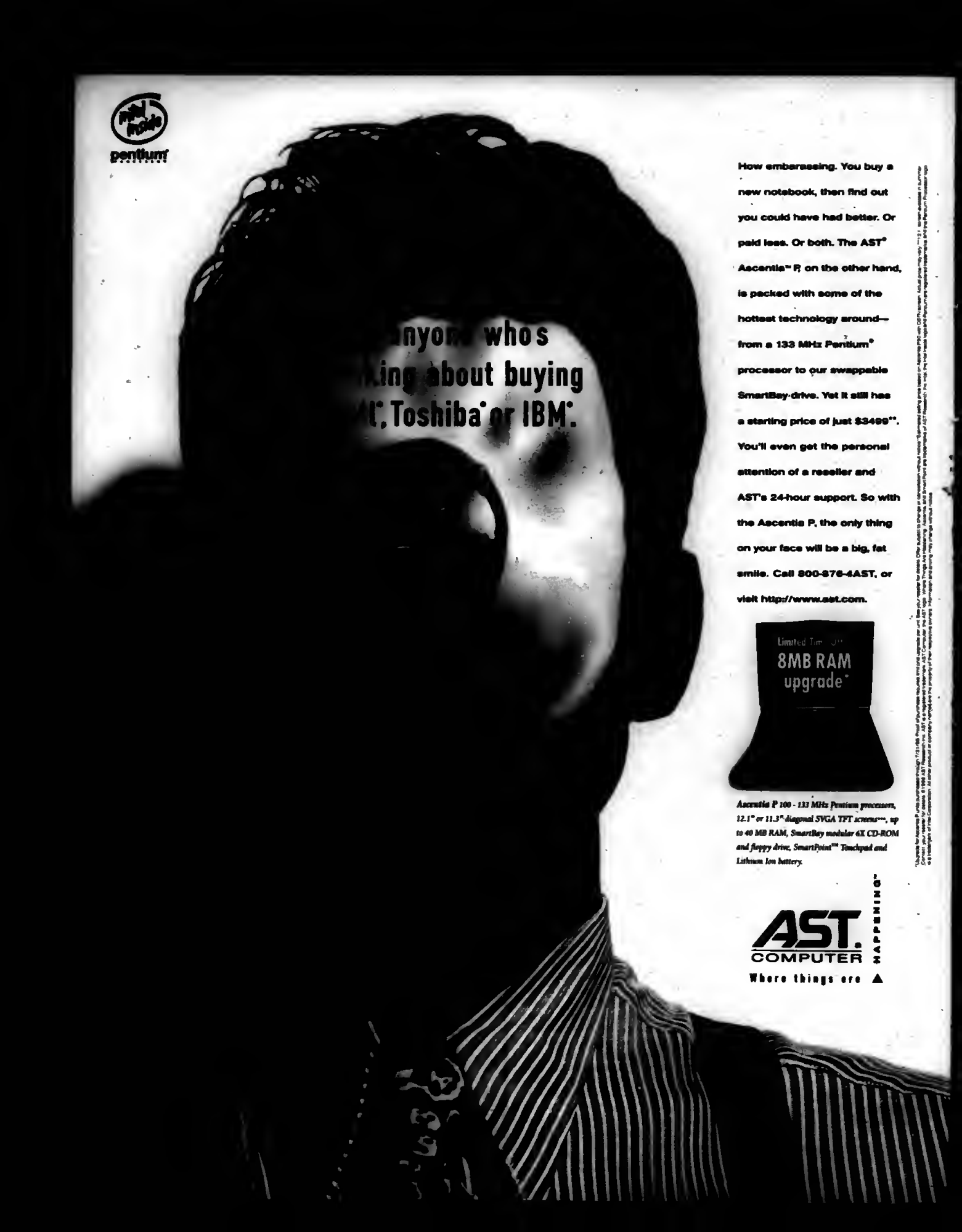
- Sales & Marketing Management
- NEW Customer Asset Management
- NEW SFA And The Internet
- Automation Strategies And Implementation
- NEW Creating High Performance Sales Organizations
- Today's Technology

Call (800) 478-3888 today for more information and a FREE 36 page brochure! Visit our Web site at http://www.DCIexpo.com/

Network World Unplugged is running concurrently in Boston. Learn from experts how to get small remote office workers and "road warriors" connected better, easier and more cost effectively. Call for more information.

SPONSORED BY: DCI

OVANC04


intel inside
pentium
nyone who's
king about buying
", Toshiba or IBM.
How embarrassing. You buy a new notebook, then find out you could have had better. Or paid less. Or both. The AST® Ascentia™ P, on the other hand, is packed with some of the hottest technology around—from a 133 MHz Pentium® processor to our swappable SmartBay drive. Yet it still has a starting price of just $3499**. You'll even get the personal attention of a reseller and AST's 24-hour support. So with the Ascentia P, the only thing on your face will be a big, fat smile. Call 800-876-4AST, or visit http://www.ast.com.
8MB RAM upgrade*
Ascentia P 100 - 133 MHz Pentium processors, 12.1" or 11.3" diagonal SVGA TFT screens***, up to 40 MB RAM, SmartBay modular 6X CD-ROM and floppy drive, SmartPoint™ Touchpad and Lithium Ion battery.
AST COMPUTER
HAPPENING™
Where things are

The Internet

January 1995
Prodigy becomes first online service with Web access and adds browser to client software

April 1995
America Online and CompuServe add browsers to client software

September 1995
Prodigy starts to migrate its contents to the Web

December 1995
Microsoft announces plans to move its proprietary online service, The Microsoft Network, to the Web

May 1996
CompuServe says it's Web-bound

Online services offer Internet access and become

Web converts

By Mitch Wagner

When three of the four major online services say they plan to move their content from proprietary technology to the World Wide Web, it seems pretty simple — like moving a car down the road.

But in fact, it is a complicated process that involves the phased transfer of gigabytes of data from one format to another. And the results might not be apparent to most users for a long time.

Vendor plans

Officials at CompuServe, Inc., Prodigy Services Co. and The Microsoft Network (MSN) have said they plan to forgo the proprietary approach of their online services in favor of the Web. America Online, Inc., the most popular online service, is the only holdout: It said it plans to continue with its proprietary software and, in fact, last week announced forthcoming upgrades.

The overwhelming majority of the online services' customers are consumers, not business accounts. But the online services' activities are significant to information systems managers because many businesses hope to use the online venue to attract consumers. And most of the consumers online — even on the Internet — got there through a proprietary online service.

Moreover, businesses that go online must decide whether to build a site for a proprietary online service or brave the open-standards wilderness of the Web.

"Online services are the Internet on training wheels," said Marvin Chow, director of interactive marketing at Reebok International Ltd. in Stoughton, Mass., which has a site on the Web and is considering making the site available on CompuServe, America Online and MSN. "Also, there's a community on an online service. The Web is such a large, ominous place that you have a hard time building a community."

Proprietary puzzle

Each of the three Web-bound online services plans to move almost all its content to the Web by the end of the year. What the three will leave in the proprietary format is a small fraction of their services — though they are uncertain what that will be.

Pricing is also uncertain. When MSN goes on the Web, parent Microsoft Corp. plans a three-tier pricing structure, with some content that will be given away, other content that will carry charges on a per-use basis and still other content available only for MSN subscribers, which now number 1 million. Officials at CompuServe, with 4.7 million members, and AOL, with 5.5 million members, wouldn't comment on pricing.

A third uncertainty concerns when the online services will ditch their proprietary client software. Theoretically, if all the online services were Internet-based, users should be able to use a single Internet package to access the 'net and all the online services. But the online vendors won't give a date when they plan to abandon their proprietary front ends. Online aficionados could use one software package for the 'net, another for CompuServe, another for MSN and still another for Prodigy well into next year or beyond.

Web converts, *page 76*

Feds turn blind eye to systems security

'net links compromise sensitive data

By Gary H. Anthes
WASHINGTON

In the film, *The Net*, a hacker breaks in to a system at the Bethesda Naval Medical Center and changes the records of the Secretary of Defense to say he is infected with the AIDS virus.

According to Senate investigators, an official at the center admitted that a hacker easily could have done just that.

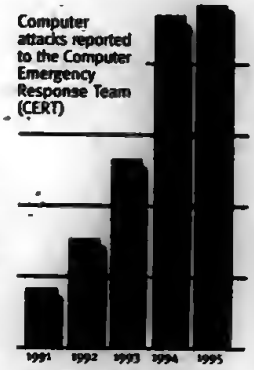
The security flaws are being patched, but the story spotlights a shocking lack of security in many sensitive government systems that are linked to the Internet. And many corporate systems are no more secure, experts said.

Most of the information about cybercrimes is anecdotal, but "what is known about the potential threat is extremely disturbing," according to a report released recently by the Senate Permanent Subcommittee on Investigations.

"Technology provides a variety of 'bad actors' with innumerable methods and opportunities to disrupt our critical information infrastructure," according to the report.

Weakest spots

The committee said there are three broad areas of vulnerability: software and hardware weaknesses, human weaknesses and the lack of a security culture — or an awareness among users about the need for security.

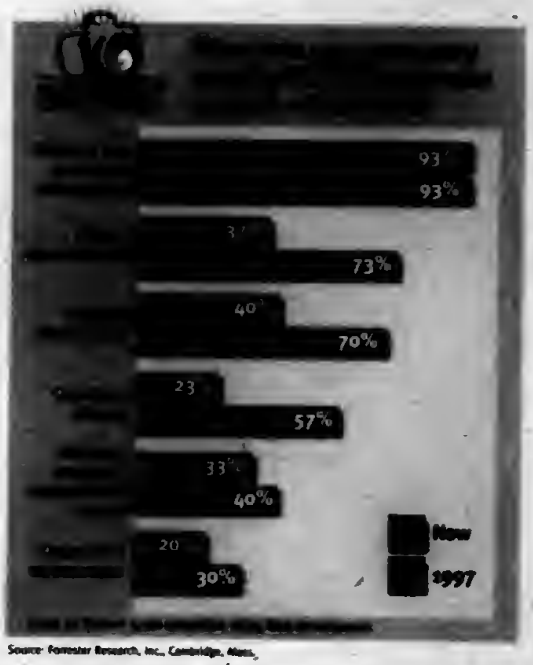


Source: CERT Coordination Center; Software Engineering Institute; Carnegie Mellon University, Pittsburgh

As evidence of the cultural problem, the committee cited studies that demonstrate that just 4% of computer intrusions at the U.S. Department of Defense are detected by users. Of those incidents, only 27% get reported to the appropriate authorities.

But the solution isn't simply to

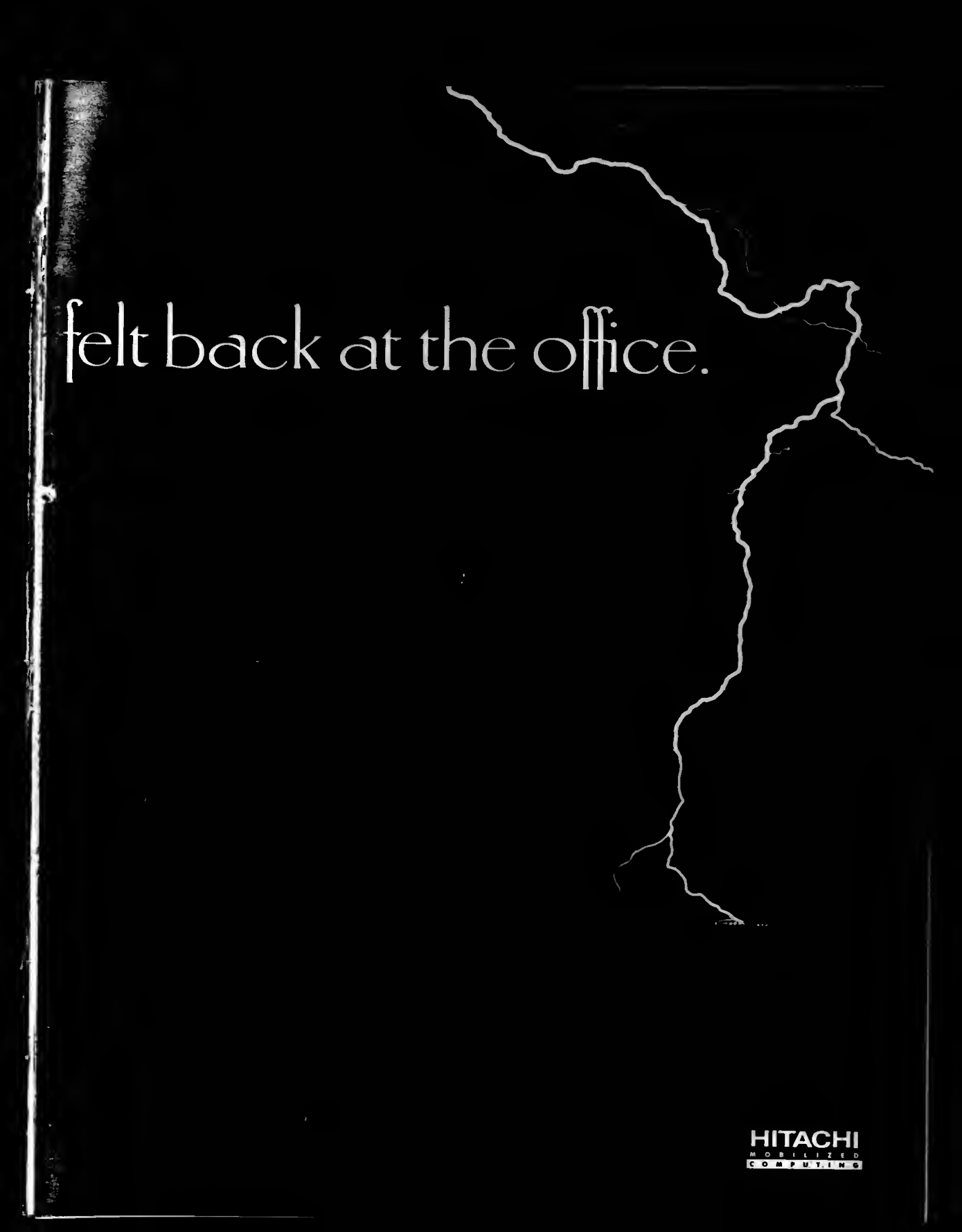
Security, *page 76*



Source: Forrester Research, Inc., Cambridge, Mass.

Make your presence

intel inside
pentium


felt back at the office.
HITACHI
MOBILIZED
COMPUTING

WebMate links database technology to 'net

By Mitch Wagner

WebMate Technologies, Inc. has launched World Wide Web server software designed to help companies improve the flexibility and speed of Internet sites by integrating the sites with database technology.

Conventional Web sites store their content in flat files, which are relatively difficult to change and are slow to open and close. WebMate/Foundation software has a built-in database to separately store content, scripts and formatting commands in Hypertext Markup Language.

"These guys are doing some pretty slick stuff," said Michael Goulde, an analyst at Patricia Seybold Group in Boston. Because the database stores data and formatting tags separately, users can change the site more easily. And data stored in a database can be accessed more quickly than it can from conventional Web sites.

More efficient

At a conventional Web site, each page is a separate file — or several files — and each file takes time to open and close. By using database storage, the equivalent of many Web pages can be stored in a single file, which reduces the system overhead required to open and close files.

WebMate/Foundation software also has a built-in scripting language — a mix of the C and Perl programming languages — and built-in debuggers that make programming more simple, said Anker Berg-Sonne, vice president of engineering at WebMate in Canton, Mass.



WebMate/Foundation software lets users connect databases with the Web

WebMate isn't alone in offering links between databases and the Web. Most of the commercial Web servers, including those from Netscape Communications Corp. and Microsoft Corp., offer database connectivity. In those cases, data is taken from a database and incorporated in conventional, flat-file Web sites.

And database companies Oracle Corp. and Informix Software, Inc. offer data stored directly in Web sites. But WebMate claims its Web server with database is implemented in an architecture that is faster and more secure than the systems used by Oracle and Informix.

WebMate/Foundation will become available today. It costs $90 for a two-month introduction, after which it will cost $495. It will be available on Microsoft's Windows NT and common versions of Unix. It will support all common browsers.

A SQL database gateway that will let Web sites access data stored in corporate databases will be available in the third quarter. It will cost less than $1,000.

Also in the third quarter, WebMate will release a module for processing payments online. It will cost less than $1,000.

Netscape chair floats online ideas to promote and fund America's Cup

By Charles Babcock

Jim Clark, chairman of Netscape Communications Corp., said he is going to use the Internet in new ways to lobby for a pet cause: the America's Cup challenge.

Clark wouldn't provide specifics, but he said he is going to cash in on some of the popularity of his company's World Wide Web page.



Clark, who spoke recently at the St. Francis Yacht Club in San Francisco, said Netscape's Web sites receive 75 million hits a day. He said he thinks some of those visitors will link to a Web page for *AmericaOne*, the proposed challenger to New Zealand for the America's Cup in 2000.

Clark will be chairman of the drive to raise funds for *AmericaOne*, which will cost $30 million to $40 million to design, build and sail. Clark hinted that one way to generate support would be to create a Web page that reports on the ship's design and computer-simulation studies.

"The Internet is an entirely new medium. There's a lot of creative things you can do," he said. Clark said he plans to use the Internet to directly solicit funds. He has pledged to raise a percentage of the necessary funds himself but said he wants to popularize the sport, not donate all the funds.

Clark's references to yacht designer Bruce Nelson and crew made it clear that they might be expected to take part in Web site discussion groups.

Paul Cayard, future captain of *AmericaOne*, showed promise as a discussion group participant when asked if he was open to including women on his crew. "This is San Francisco," he said. "We're open to anything."

Web converts

CONTINUED FROM PAGE 73

Prodigy did make one concession in that regard, however. Company officials said that by fall the Prodigy client will work with the standard Internet access software included in Windows 95. They wouldn't comment on when it might support other Internet access software.

Officials at the online services said the companies have been pushed to the Web by its overwhelming popularity and by demand from customers. They also said they like that Internet software comes to them off-the-shelf, allowing them to turn staff from writing software to other tasks.

"We're not in the software business," said Kevin Knott, vice president of strategic planning and development at CompuServe in Columbus, Ohio. "For years we've had to develop the technology because it didn't exist. That's a strain on our people and investment dollars."

Security

CONTINUED FROM PAGE 73

avoid Internet use, said David S. Bauer, a principal and security specialist at Morgan Stanley & Co. in New York.

"We have to attack the culture and build trust," Bauer said in a speech at a recent meeting of the New York chapter of the Information Systems Security Association. He said senior managers at Morgan Stanley balked at connecting to the Internet because of their perception that it is "hemorrhaging information."

Bauer called on the industry to build a "public key infrastructure," a broad set of interoperable technologies built around public-key cryptography and digital signatures that would offer identification, authentication, privacy and integrity services.

Be prepared

That would give rise to a "culture of trust" that would let companies fully exploit the potential of the Internet, Bauer said.

Current work in this area is a piecemeal effort by product vendors and isn't likely to produce a seamless infrastructure without more active involvement from users, Bauer said.

The Senate report, distributed at a recent hearing on "Security in Cyberspace," pulls no punches in denouncing the government's lack of preparation for Internet-borne mischief. It cited the following examples:

- Because the U.S. Department of State has no security plan for its unclassified systems, it can't tell if those systems are compromised.
- The Federal Aviation Administration's computers are relatively immune to hackers, not because they are carefully protected but because they are so antiquated that they are inaccessible by modern hacking tools.
- A senior intelligence official recently was quoted as saying that government efforts to collect data about "information warfare" threats are like "a toddler soccer game, where everyone just runs around trying to kick the ball somewhere."

The Senate investigators recommended the establishment of a national "threat center," staffed around the clock with officials from law enforcement, intelligence and the military.

Corporations need to boost their commitment to information security, said Richard Power, an analyst at the Computer Security Institute in San Francisco. "Organizations that don't already have [a security] program in place must implement one immediately," he said.

Hackers land at air force base

On March 23, 1994, two hackers on the Internet penetrated computers at Rome Laboratory at Griffiss Air Force Base in New York.

A report from Senate investigators published last month described how the hackers, "Datastream Cowboy" and "Kuji," accessed the lab's data, which included sensitive weapons research information.

Before the break-in was detected five days later, the hackers had installed "password sniffers" on seven computers, which led to the eventual compromise of 20 systems at the base.

Using the Rome computers as a base of operations, Datastream Cowboy and Kuji traveled the Internet and hacked their way in to systems at other government facilities. They even found their way in to the corporate networks of defense contractors.

On May 12, after a complex six-week investigation that spanned four continents, police arrested Datastream Cowboy, a 16-year-old hacker in England. They never learned the identity of Kuji, but investigators suspect the second hacker may have been a foreign agent.

Investigators couldn't determine the extent of the attack or the damage done. "It is very difficult to quantify the loss from a national security perspective," a Senate report concluded. — *Gary H. Anthes*

Hitachi Introduces

MOBILIZED COMPUTING.

Starting today, we invite you to make things happen from wherever it is you happen to be. To extend your reach so dramatically that previously inconvenient details-like time, space, the Pacific Ocean-are no longer a problem.

The means to this are the new Hitachi PC Series M and Series C Notebooks. Potent tools in your endless struggle to manage events and outcomes far from where you actually are.



Hitachi PC Series C Notebook
Fully featured optimized for communications Available with 11.8" active matrix screen Pentium® 120 MHz CPU 5.3 lbs and 1.5" high yet floppy drive is built in

Hitachi PC Series M Notebook
Optimized for multimedia presentations 8x CD ROM drive LAN port Available with 11.8" active matrix screen and Pentium® 133 MHz CPU

Each embodies the Mobilized Computing™ concept. Meaning Hitachi Notebooks come ready to communicate via 28.8 Data/Fax modem over America Online®, CompuServe®, Prodigy®, Netscape Navigator™ and two-way fax.

Each is engineered on the premise that no intelligent person should waste his expensive time configuring modems or attending to other cyber-trivia. So, it's all mounted and ready to work at first startup. Built to standards exemplified by a five year warranty.

It's amazing the effect that a well-placed word from you can have.

The point of Mobilized Computing is to project those words to any point on the planet. Our apologies to any colleagues who thought that when you were away, you were away.

HITACHI
MOBILIZED COMPUTING

Remote Control™

For information on your nearest dealer call 1-800-Hitachi (448-2244) Website address www.HitachiPC.com

© 1996 Hitachi PC Corporation (USA) All rights reserved Mobilized Computing™ and Remote Control™ are trademarks of Hitachi PC Corporation (USA) which may be registered in some jurisdictions The Intel Inside Logo and Pentium® are registered trademarks of Intel Corporation All other marks are owned by their respective companies

Microsoft



Will the Internet bring an end to business computing as we know it?

Not at all. It will simply knock down the walls between people, between departments — even between companies.

The promise of the Internet, while intoxicating to some, is threatening to others. Because along with the unlimited access and opportunity it provides, comes the need for new strategies and new technologies. Happily, those who've begun the transition to client-server already have much of what they need in place. And to help businesses incorporate the Internet and intranet into their operations, Microsoft is integrating the necessary technology into many of its products — from desktop to server to tools.

For example, it's never been easier to connect desktops to the Internet. That's because both Microsoft® Windows® 95 and Windows NT® Workstation operating systems have all the "plumbing" built right in. Viewing content is just as effortless. With Microsoft Internet Explorer, users can browse the Internet (or internal corporate webs) whether they're working on the Windows platform or on the Macintosh.™

Of course, making web content easy to view is only the beginning. To be useful to organizations, content has to be easy to create, too. Which is why the latest generation of Microsoft Office applications, along with Internet Assistants, allow users to develop web content without programming. They simply save their work as HTML, the way they would any other document. Such ease-of-use also extends to the newest member of the Microsoft Office family, the Microsoft FrontPage™ web authoring tool, which lets users create and manage entire web sites, even if they've never so much as programmed a VCR.

The Internet is very much a part of our BackOffice™ family, too. With Microsoft Internet Information Server, we've extended the performance of Windows NT Server to make the ideal Internet platform. Now every organization can host and manage web content and applications securely and reliably. And, with Microsoft Exchange Server, secure and reliable e-mail is also a reality, whether it's traveling over the Internet or within your organization.

The truly interactive web page has arrived as well...and with it, full motion video, audio and moving text. Advances made possible by technologies like ActiveX™ controls, which let developers embed sound, video, and applications without having to learn new languages.

Yes, the walls are coming down, but it's not the end of business computing. Just the next, most practical evolution.

To learn more, or to download our free Internet products, visit http://www.microsoft.com/internet/go2/

© 1996 Microsoft Corporation. All rights reserved. Microsoft, Windows, and Windows NT are registered trademarks, and Where do you want to go today?, ActiveX, FrontPage, and BackOffice are trademarks of Microsoft Corporation. Macintosh is a trademark of Apple Computer, Inc.

Band-width is tight. ATM sounds nice. But it also sounds pretty darn expen-sive.

[redacted] IBM presents the first affordable 25Mbps ATM Workgroup Solution. Everyone is talking about ATM as the answer for speeding up busy networks. But there are two good reasons why business hasn't stampeded en masse to the ATM solution: It costs a lot. And to get there, you have to rip out everything you have.

Well, with all respect to the status quo, IBM now unveils the new 25Mbps ATM Workgroup Solution. It comes complete with workstation [redacted] adapters, giving you an immediate boost in bandwidth, with plenty of room to grow in the future. And it all comes at the refreshingly low price of $495 per connection.

So why just dream about getting an affordable ATM solution when you can install one today? See your nearest IBM reseller or call us at 1 800 IBM-2468, ext. DA130, to learn more. Or, if you prefer, you can visit our Web site at www.raleigh.ibm.com/netad.html for all of the details. We have lots of information to share. And the good news is, we can get it to you fast.

IBM.

Solutions for a small planet™

In Canada, call 1 800 IBM-CALL, ext. 6025. The IBM home page is located at www.ibm.com. IBM is a registered trademark and Solutions for a small planet is a trademark of International Business Machines Corporation. © 1996 IBM Corp. All rights reserved.

A health-care coalition is developing a framework to ease the exchange of information, 82

Corporate Strategies

TRUCK STOP!

Mack Trucks jumps on frame-relay highway

By Kim Girard

Leave it to Mack Trucks, Inc. to find a way to send its legacy and LAN traffic barreling down a single network.

Last year, the Allentown, Pa., truck and engine manufacturing giant considered upgrading its point-to-point network. Instead, Mack made a move for the long haul by choosing frame relay.

Frame relay won Mack's support because it allows Mack to run SNA and TCP/IP more efficiently over the same network.

"Right now, we are probably about 95% SNA and 5% TCP/IP," said Tim Koch, a senior communications analyst at Mack. "But as we use more LAN applications, the TCP/IP traffic will grow."

With the move, Mack aims to avoid network redundancy, control operating costs and get bandwidth on demand, Koch said.

"We've gained the flexibility of handling multiple protocols and more traffic."
— Tim Koch, Mack Trucks

"With frame relay, we've gained the flexibility of handling multiple protocols and more traffic," he said. "Plus, we've significantly increased our redundancy by adding backup paths to even the smallest sites."

The network is configured with two permanent virtual circuits (PVC), so that the TCP/IP traffic goes over one PVC and the SNA traffic over the other. With a line failure, both protocols are automatically rerouted to the other side of the network to provide full redundancy at the central site.

Flexible frame

Frame relay gives Mack the flexibility to optimize network cost and performance, said Liza Henderson, an analyst at TeleChoice, Inc. in Verona, N.J. "It will also [let them] further scale the network in the future as growth demands," she said. TeleChoice estimates that up to half of all frame-relay users are running some SNA traffic over the network.



Mack's network links 25 U.S. and Canadian sites, including parts distribution centers, regional offices, suppliers, Mack-owned dealerships and a manufacturing facility. Within 40 days, 21 sites were hooked up, Koch said. Despite the rapid pace of deployment, rollout issues were minimal, Koch said.

Mack could have saved money by using frame relay instead of expensive private lines, but the company invested that money in a dial backup system.

"We took something very simplistic and made a very robust network," Koch said. "Had we stayed apples-to-apples, we could have had savings."

Mack is using Motorola, Inc. products, including the Multimedia Periphery Router 6520 and Vanguard 300 frame-relay access device (FRAD). A router or FRAD was installed at each site, depending on the size of the facility. The Vanguard 300s were used at smaller sites to save money, and the 6520s were installed where the company needed more serial ports.



Mack Trucks *made a sharp turn to frame relay, which allows the company to run SNA and TCP/IP more efficiently over the same network*



James L. Nobe *is president and CEO of Freightliner, where an in-house application is cutting diagnostic time at dealers nationwide*

Freightliner tool drives employee efficiency

By April Jacobs

Looking under the hood may become one of the *last* steps in fixing a Freightliner big rig, now that dealers have a client/server application aimed at pinpointing a problem.

The application, dubbed ServicePro, includes a case-based logic component, according to Doug Vakoc, Freightliner Corp.'s director of technical service systems. The Portland, Ore., company developed the application in-house.

"I've never seen anything like it," said Kimberley Brewer, a service writer at the Fyda Freightliner dealership in Columbus, Ohio. She recalled when a driver came in with a heating problem that seemed to elude everyone. But with ServicePro, all it took was four questions to come up with a possible faulty valve.

The truck was repaired in a half-hour, she said, whereas it might have taken several hours to pinpoint the problem manually.

"As we expand our product lines . . . it's really important to make maximum use of the manpower we have."
— Doug Vakoc, Freightliner

A big ServicePro advantage, Vakoc said, is that a service person can diagnose a rig's problem when he takes down the initial information from a driver who is experiencing problems on the road. That way, when the driver brings the rig in to be fixed, the mechanic already knows what is likely to be wrong with it.

Nuts and bolts

Vakoc said the ServicePro application is purchased primarily by independent Freightliner dealers across the country. It runs on Microsoft Corp. Windows NT servers with a Windows for Workgroups client. A SQL Server database, which resides on the server at the dealership, contains information that service desk users and technicians access daily. That database is updated via CD-ROMs sent out periodically by Freightliner.

For information about product warranties, recalls or parts, dealers can access an IBM mainframe located in Portland via Freightliner's frame-relay network.

"We're still rolling out the system, but we have about 150 dealer installations to-

Freightliner, *page 83*

Rx for managed-care interoperability

Alliance proposes to help health care providers share patient information

By Thomas Hoffman

A group of medical-care providers is preparing a set of software that should help hospitals and other organizations share patient information more easily.

The effort comes in response to the cost pressures associated with managed health care that have driven doctors, hospitals, pharmaceutical companies and other organizations to become more patient-centric and to share information more freely.

More than 80% of the 5,500 acute-care facilities in the U.S. have linked their networks to other facilities with which they share patient files and other information, according to Deloitte & Touche.

The problem is that the health-care industry has lagged behind other vertical industries when it comes to technology standards and system interoperability.

"We're about 10 years behind the banking industry in this area," acknowledged Nancy Hinckley, a marketing program manager at Hewlett-Packard Co.'s Medical Products Group in Andover, Mass.



To overcome those challenges, a group of industry players has banded together to establish common data-interchange standards.

The Andover Working Group for Open Healthcare Interoperability, formed in March by HP, comprises 54 health-care providers, hardware and software vendors, systems integrators and pharmaceutical companies.

The group is developing an object-oriented framework that incorporates existing health-care information interchange standards, such as Digital Imaging and Communications in Medicine and Electronic Data Interchange For Administration, Commerce and Transport.

The framework will also use capabilities of both the Common Object Request Broker Architecture (CORBA) and OLE technologies.

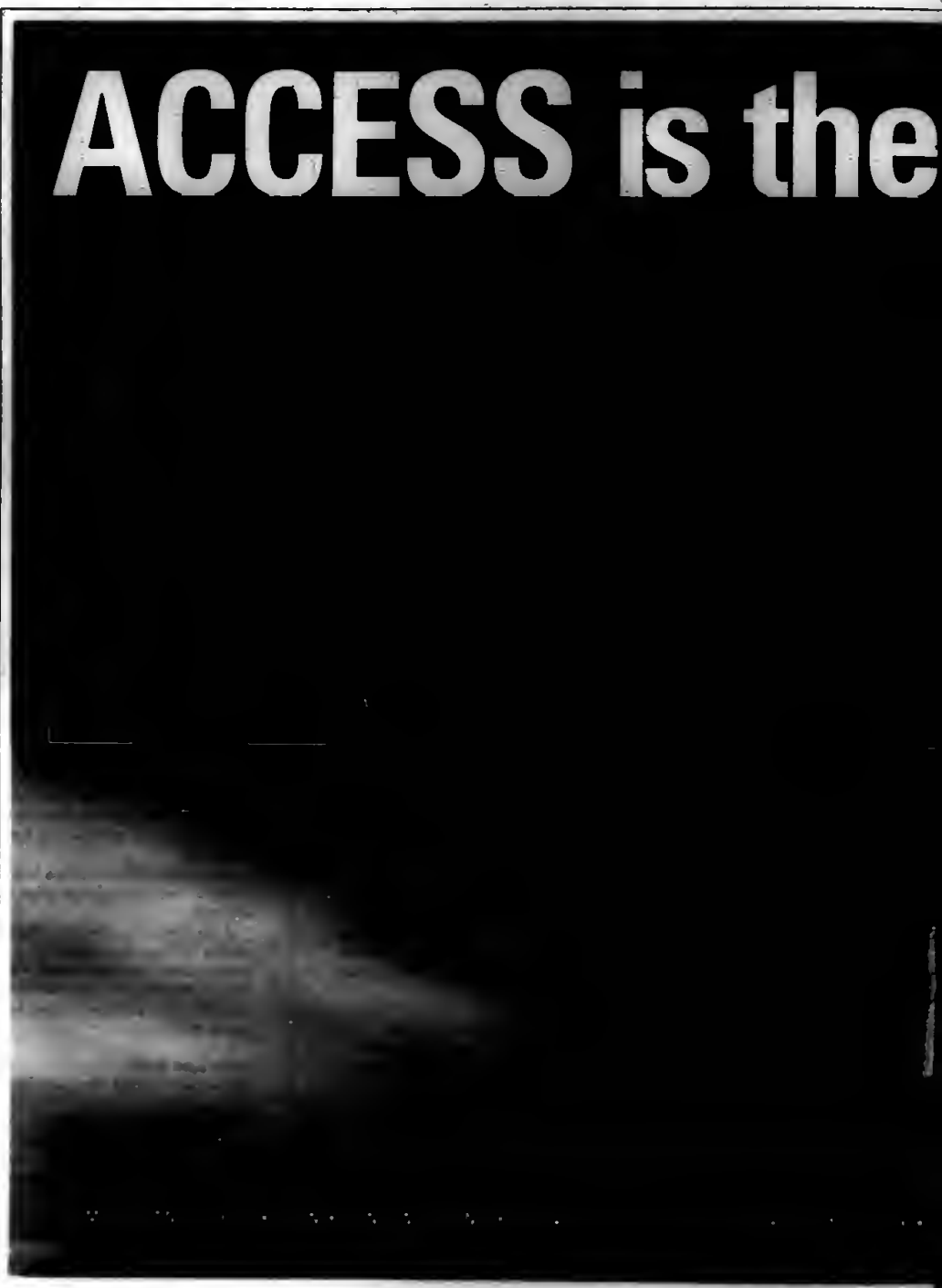
Plug-and-play

Through the development of an Enterprise Communication Framework, Andover Group says it expects to establish plug-and-play interoperability among a variety of clinical and patient applications.

"The primary challenge for us is interoperability between enterprises," said Christopher J. Macmanus, vice president of information systems at Beth Israel Hospital in Boston. Even though Boston is a hub for managed-care players, "there are major deficiencies in interoperability between [health-care] providers and payers," Macmanus said.

The first standard under attack by Andover Group is Health Level Seven, a protocol standard for the transmission of clinical and administrative information.

Andover Group's aim is to allow organizations to pick and choose between CORBA and OLE, Hinckley said.



BankAmerica expands online banking

By Mitch Wagner

BankAmerica Corp. is taking personal finance on the Internet a bit further.

The $16.5 billion San Francisco bank has begun to let customers pay bills online on the Internet, even if the recipient of the money doesn't have an account with BankAmerica. Other big banks, such as competitor Wells Fargo & Co., allow users to transfer money between accounts — moving money between two places on the same computer system.

The BankAmerica site allows customers to send money to noncustomers by filling out a form on the company's Internet site at www.bofa.com. That triggers an electronic-mail message to a bank employee, who sets up the transaction off-line with the person who will receive the money.

BankAmerica also offers the service with the Managing Your Money dial-up software for PCs and on America Online.

"You can see how the battle for Web capabilities in online banking is stepping up," said Phoebe Simpson, an analyst at Jupiter Communications in New York. "Until recently, Web banking was a pie-in-the-sky idea; now, the large banks are starting to compete with their Web-banking services."

BankAmerica sees online banking as a natural extension of its other electronic banking services — including automated teller machines — offering customers convenience and the ability to bank from home, at any time.

And the technology is also an extension of automated teller machine (ATM) technology, said Robert Newton, vice president of interactive banking product development at the bank.

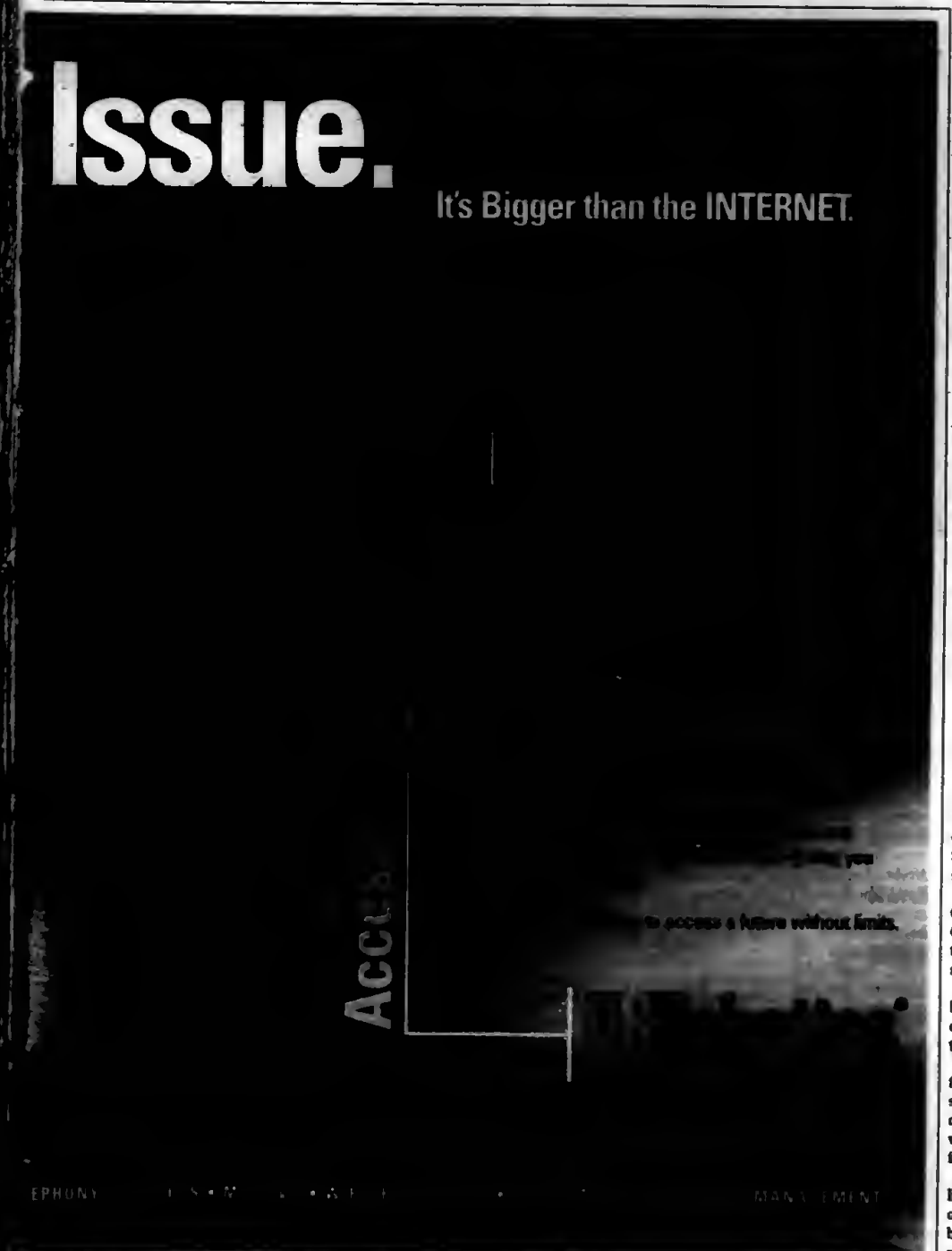
How it works

The back end of the system is the company's IBM mainframe-centric network that links branch offices and ATMs. Linked to the mainframe is a Tandem Computers, Inc. server that has hosted home-banking services since BankAmerica started permitting dial-up access to its accounts 15 years ago, Newton said.

The Managing Your Money software dials directly in to the Tandem box, Newton said. Customers can also reach the bank from AOL, through a Sun Microsystems, Inc. SPARCserver 20 that runs custom software built by Destiny Software Corp. in Elverson, Pa. AOL simply passes data from its own servers to the SPARCserver, which translates the data for the Tandem machine and feeds it in to the mainframe.

For the bank's Web site, BankAmerica runs Enterprise Server software from Netscape Communications Corp., with built-in encryption for security. The server software runs on a Sun SPARCcenter 1000.

The bank selected the modular software and hardware strategy to guarantee flexibility and ease of modification for the system.



Freightliner

CONTINUED FROM PAGE 81

day," Vakoc said. The company developed ServicePro in C++, with Microsoft as a consultant on the project.

Chip Gliedman, an industry analyst at Giga Information Group, a consultancy in Cambridge, Mass., said systems such as those at Freightliner seem to be growing in number.

"There are fewer people to turn to for help," he said. "What these systems really do [is let employees] concentrate on what they're being paid for."

Vakoc said the company wanted an interface that would allow technicians to use several different types of reasoning when diagnosing which part is malfunctioning, without needing to learn different interfaces.

ServicePro is critical to Freightliner's progress, Vakoc said. "As we expand our product lines to fire engines and school buses, it's really important to make maximum use of the manpower we have."

Love IT; Hate my

By Robert L. Scheier

"Happy families are all alike. Every unhappy family is unhappy in its own way."

Leo Tolstoy, from Anna Karenina

Computerworld's annual survey of top executives shows that they like what information technology can do for their businesses. But the bigwigs aren't all that enthused with the people running their own IS organizations. Just as with unhappy families, there's no one reason why the relationship between IS and business managers breaks down. Here, some of the 400 executives surveyed describe why they're unhappy.

The Cobbler



A marketing manager at a travel services company thinks of his information systems department as a cobbler who makes better shoes for his customers than for his own children.

IS regularly rolls out top-of-the-line hardware and software to key outside customers such as large travel agencies. But inside the company, some staffers who work the help desk are still stuck on dumb terminals, forcing them to forward PC support calls to other help desk personnel who have PCs, the marketing manager says. Until three or four months ago, users on different LANs or in the field often found it hard to share documents because they used different versions of Microsoft Word or ran Microsoft Works instead of Word, he says.

The contrast was not only galling, but also embarrassing. "It was difficult to ... position ourselves as a technology leader when our internal level of technical expertise was somewhat behind the times," he says.

Management focused on deploying technology to its customers because "that was the business we were in; that's where we derived our money."

That has changed over the past 18 months, he says. More than three quarters of the users now have 486 or Pentium PCs, and more than 90% are standardized on Word 6.0. Still, the disappointment in IS lingers. "The organization one would normally expect to be the advocate of change, the advocate of the efficiency of new equipment, was not," the marketing manager says. Instead, "the [users] had to take over the advocacy themselves."

Pleading Poverty

Most of the executives we interviewed asked not to be identified because they still have to work with the IS organizations they criticized. That anonymity prevented us from asking most IS organizations for their side of the story.

One exception is Commercial Federal Corp., a savings and loan institution in Omaha. David Kellogg, manager of financial reporting, and Dennis Zimmerman, director of IS, had much different views about what was important to the organization and who was responsible for such things as training budgets. After hearing Kellogg's comments, Zimmerman says he may need to spend more time communicating with business managers and managing their expectations.



Kellogg isn't bothered as much by what his IS department provides as he is by what it can't provide because it doesn't have the money. All too often, he says, "you're only getting 10[%] to 20% of what the system can do" because of a lack of money for customization and training. For example, a real estate tracking system "had a lot of nice features ... but the reporting capabilities had to be customized, [and] there's an overall lack of resources to ... generate the custom reports," Kellogg says.

Zimmerman has a different perspective, driven by demands from senior management to cut costs. "Anytime you customize software, it entails additional cost and additional work. It's been my directive to only customize where absolutely necessary," he says.

Training is another sore spot for Kellogg because the company trains "five or six people, maybe 10, and [they] are supposed to go back and train everyone else. Not everybody has the time to ... learn all these

Illustrations by Tom Tomalo

CHECK IT OUT!
WEB SITE REVIEWS,
PAGE 86

IS *department*

complex systems. [Over time] less and less gets passed on. Within a year or so, as turnover occurs, you're losing knowledge."

"I'm sure that's true," Zimmerman says, but he again cites financial pressures: "There's a cost to training, and every business today is trying to minimize those costs."

Who is responsible for making such decisions? Kellogg says it's up to the IS director to find money for customization and training because they are "major aspects of an implementation plan." But Zimmerman says the training budget is largely set by senior management, and he and users make customization decisions.



The Order Taker



As a former programmer, this financial analyst doesn't take pleasure in criticizing the IS function at his East Coast insurance company. "There are good people down there, and they work hard," he says. "But all too often they're order takers and backlog creators."

By which he means that IS professionals will usually accept orders from users without asking the right questions. One example, he says, involves allowing users to install 30 dedicated telephone lines to give agents access to applications from the field. But "they never had more than two or three [lines] in use simultaneously," he says. The systems analysts never asked the right questions to better predict the system's use.

The IS department also followed, rather than led, the company's move to client/server technology, the analyst says. "They were sort of standing around, waiting for us to make requests," he says. "For me, that indicates a strategic lack of leadership."

The Dunce

Strategic systems? No problem. Replace my hard drive in two hours? Ummmm . . .

That's the reputation IS has at a large telecommunications firm, according to the company's East Coast marketing director. "At a corporate level . . . they're doing great things; re-engineering our systems, allowing access to data . . . tying databases together that weren't together before," he says. Those benefits are real and important, but "the guy with the tool belt, he's real slow in coming."

Users are partly to blame for their own support woes, he admits, for using many different brands of modems and PCs. That situation is improving as old PCs are replaced with a standard desktop configuration, "but that's being done on an attrition basis," he says.

As in other companies, IS got slammed for being slow to champion new technology, such as Lotus Notes. "There are pockets of [Notes servers], but it's hell to pay to just get up on it," he says. Promoting new technology that can help the business ought to be part of IS' mission, but "you don't hear from them much," he adds.

Hung Out to Dry



When a baseball team founders for long enough, it could be in for a major housecleaning. That's what's happening at Tellabs, Inc. in Lisle, Ill., as it moves from a "sleepy, but got-the-job-done" AS/400 environment to SAP's R/3 client/server financial software, says vice president of strategic resources Tom Gruenwald. While Tellabs changes its software infrastructure, it's also challenging the IS staff to shape up or ship out.

Historically, the changes IS made to systems "weren't all that large" and required no real project management skills, he says. "They really didn't know how to plan, staff and budget [for] a fairly large project," Gruenwald says.

The organization had grown complacent and unresponsive, Gruenwald says, but "we have put a new manager in place who is a lot more customer-focused" and who has replaced some lower-level staff. Anyone who can't or won't learn both the new computing environment and the new focus on customer service is out, he says. ■

Scheier is *Computerworld*'s senior editor, management.

This week on our World Wide Web site (www.computerworld.com), look for more survey highlights, and join an online discussion about user and IS issues with DuWayne Peterson, former chief information officer at Merrill Lynch & Co. and Security Pacific Corp.

Business managers think computers are helping. . .

I feel IT is making a fair, good or excellent contribution to:

- Operational/financial performance
- Quality of decisions
- Quality of internal communications
- Quality of products and services
- Responsiveness to business change

Percentage of business managers who agree with the statement

. . . but their own IS departments are falling short.

I am neutral, dissatisfied or very dissatisfied with:

- The quality of IT application development
- IS level of flexibility
- IS ability to deliver projects on time
- IS project management capabilities
- The quality of IT operations

Percentage of business managers who agree with the statement

NOTE: Results are from a *Computerworld* survey of 400 business managers conducted in February. Half of the respondents work at companies with less than $500 million in annual revenue; 25% are at firms with at least $1 billion in revenue; and 25% work at companies with revenue between $500 million and $1 billion.

Of those responding, 25% hold director-level positions, 32% are vice presidents, 20% described themselves as "senior management," and 3% are CEOs. Sixty-two percent of those surveyed are responsible for finance and marketing within their companies, and another 12% are primarily responsible for personnel.

Surf sites



Practical Internet sites for IS managers

By Leslie Goff



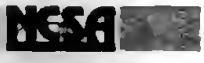
Sources Ejournal

www.dse.com/sources

This off-the-beaten-path online magazine offers compelling reading, especially if you need something else to keep you up nights worrying about the security of your corporate network.

Each issue (three were online last month) has at least one article about information technology and the intelligence community that's of interest to anyone responsible for corporate network security. For instance, an article on how the Central Intelligence Agency used electronic banking and other financial records to bring down drug lords shows just how vulnerable networks can be.

Regular features include a "Sage of the Age Interview," such as a Q&A with Winn Schwartau, author of *Information Warfare: Chaos on the Electronic Superhighway*. The articles have an insider's tone, and they read like a cross between *All the President's Men* and *Fear and Loathing in Las Vegas*. If you need a little reassurance when you're done, go immediately to the National Computer Security Association home page.



National Computer Security Association

www.ncsa.com

Here's an association site that does what it should: disseminate information to the larger community.

You'll find the de rigueur membership information here, but the emphasis is on relevant and actionable content.

You can get descriptions of common computer viruses and tips on avoiding them from the Virus Help Desk (click on the Virus Information button). Or find out about recent alerts issued by the Computer Emergency Response Team (CERT) centers worldwide, such as a notice that Purdue University researchers have discovered a flaw in the Kerberos computer security system. Check out the association's new antivirus and firewall-testing certification schemes. Every page is rich with thoughtful links to other pertinent, hard-to-find sites. For instance, CERT's Kerberos warning contains a link to details posted on a Carnegie Mellon University server. You may end up linking out of this site numerous times, but chances are, each time you get out, it will just pull you back in.

Goff is a freelance writer in New York.



The Knowledge Management Forum

www.lea.com/~bonewman

As you peruse the member postings at this semi-interactive site, you start to feel as if you've stepped onto the porch of a general store where everyone's sitting around the cracker barrel swapping opinions on the high school football team. But the opinions and information being exchanged here deal with the very intellectual subject of knowledge management, and the exchange is highly organized.

You can meet the members, as the site includes a full list of participants that notes their interests and credentials. You can join discussion groups (for now, via electronic mail only) in 13 subject tracks, such as Capturing Corporate Knowledge, Building Knowledge Architectures and Intranets.

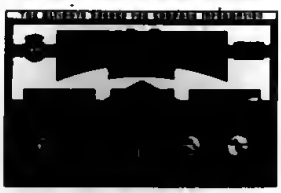
The site includes an index of related papers, publications and books, as well as reviews and links that are diverse yet focused on the subject at hand. The site's members — interested parties can join on the spot — post concise, thought-provoking comments, making this site a worthwhile place where information systems managers can drop by and pull up a chair.

Hoover's Online

www.hoovers.com

Use the free areas of this site as a business research tool if you're checking out the competition, looking for vendors, preparing a presentation or job hunting.

The MasterList Plus database, which boasts some 10,000 companies, is cross-referenced by company name, ticker symbol, location, industry and sales volume. You get the basic data — address, officers, sales figures, number of employees, description — and a link to the corporate Web site. You also get links to more information on other servers, such as EDGAR for Securities and Exchange Commission filing information. Who's On Top, a list of lists, such as the 10 Largest Workstation Manufacturers, The Fortune 500 and America's 100 Most Admired Companies, is a fun and useful resource here.



Business Bestsellers is also useful. It reviews the top books for executive readers. The home page at Hoover's Online is a bit overwhelming, however. Click on the What's Here button on the graphical navigation map to get a table of contents, and use that to maneuver around the site.



The Technology Partners, Inc. Sourcing Directory

www.tekptnr.com

This site, a user's guide to the outsourcing industry, is hosted by a consulting firm. And the firm does an exemplary job of remaining unobtrusive while you use the site's resources.

The firm contains its pitch to one clearly marked section (Info on TPI) and doesn't exploit opportunities to promote itself within the site's content. Instead, the hosts focus on facilitating your search for vendor information and connecting you with peers. The best resource at the site so far is relatively new. It is The Vendor Directory, which features a useful search engine that enables you to find outsourcers by name or by any combination of services offered, location and industries served. (A search for firms that offer business process re-engineering services to the health-care industry in the U.S. yielded six companies that the system rated as "highly relevant.")

The most promising sections, Marketplace and TPI Chat, are meant to foster communication among IS managers, outsourcing vendors and TPI's consultants. But they are as yet somewhat underdeveloped. The TPI Library and TPI News Room sections are also worth a look, particularly if you want to link to related information on specific outsourcing topics, such as legal issues. ■

Job hunting? Check out more Web sites in our Computer Careers section.



"Thanks to Sprint Business, more of our flowers are popping up all over the world."

— Meg Whitman, CEO, FTD Inc.

FTD,® a company known the world over for its fine floral arrangements, needed to streamline its international order process. They used to rely on fax, phone, telex and cable to transmit orders.

"Sprint helps us process orders in half the time."
Sprint put FTD on its global data network. Now, florists can transmit information instantly. So a florist in Indonesia can send an order directly to a florist in England, or anywhere else in the world, with exceptional speed and accuracy.

"Our business is blooming all over the world!"
Now, Sprint helps FTD florists in over 143 countries send more flowers, to more people, worldwide than ever before.

Find out how Sprint Business can help grow your business, too.

Call Sprint Business
1·800·816·REAL
www.sprint.com

Sprint.

We help business do more business™

© 1996 Sprint Communications Company L.P. All trademarks are property of their respective owners.



IS Manager's Bookshelf

Why Loyalty Still Works

Loyalty is the secret of long-term success in business, Frederick F. Reichheld argues.



The Loyalty Effect

By Frederick F. Reichheld with Thomas Teal
(Harvard Business School Press, Boston; 320 pages; $24.95, hardcover; (800) 545-7685)

Most managers today worry about having to downsize staff. Information systems managers not only have that worry, but the more profound one of keeping qualified staff. This book addresses the issue of employee retention in a thought-provoking way.

The authors, consultants at Bain & Co., share 10 years of research on why certain firms achieve better financial performance than others. Their thesis is that long-term performance is the result of focusing on sustained loyalty — from customers, employees and investors. Long-term customers and employees work together to create products and services that add value. And investors must buy in to this long-term, value-added concept instead of focusing on quarterly results.

The authors substantiate their premise with corporate profiles of United Services Automobile Association, Northwestern Mutual, State Farm, Leo Burnett (the Chicago advertising firm) and several others, each of which has low customer and employee turnover and consistently high performance. Not coincidentally, most are privately held or are mutual companies and thus not subject to the whims of Wall Street.

Reichheld and Teal provide numerous examples of steps companies can take that increase or undermine loyalty. The discussion of employee loyalty in Chapter 4 is of particular interest to IS managers, who have become accustomed to high turnover. Too often we recruit to fulfill short-term technical needs rather than focus on core skills such as creativity, willingness to learn and ability to communicate with users. These traits should allow the individual to contribute over the long haul.

The authors acknowledge that moving to loyalty-based management will be a tough change, not the least because of inadequate methods of measuring customer profitability (Chapter 8). However, most of the companies cited didn't start out with measures, but with principles about how best to do business. These aren't new ideas, but rather useful reminders. I'd make this book required reading at business schools; IS managers should share this book with the human resources managers with whom they work.

Computer-aided Teamwork

Teams & Technology **offers plenty of tips but not enough real-world perspective.**



Teams & Technology: Fulfilling the promise of the new organization

By Don Mankin, Susan G. Cohen and Tora K. Bikson
(Harvard Business School Press, Boston; 304 pages; $29.95, hardcover; (800) 545-7685)

The authors (who are academics and behavioral scientists) tried to show two things in this book: how to develop information systems that support collaborative work and how to create organizational structures and policies that support the synergy of teams and technology. Unfortunately, they didn't focus enough attention on how to transform old, hidebound organizations with long experience in the old, hierarchical model into the ideal. And that ultimately undermines the usefulness of the book.

To give the authors credit, they do recognize that creating teams isn't an easy proposition. The best device in the book is a fictionalized narrative that's actually a composite of several consulting projects. This narrative follows a mythical project through its various travails. All the archetypes are here — the overly ambitious corporate sponsor, brilliant but impractical; the befuddled user representative who gets su caught up in the process that he loses track of the goal; and the IS department that is at first deliberately excluded, but then is brought in to clean up the mess. Sound familiar? You bet.

The core problem is that the authors spend too much time telling us what we should do.

We get lots of bullet lists, matrices and other perspectives that sound great on paper but are nearly impossible to implement in existing corporate cultures. Corporate sponsors aren't selected; they elect themselves because of ego, power or perceived ability to get things done. User representatives are put on teams because they're available or highly knowledgeable, not because they're suited to be team players. IS is often a spectator because resources are already committed to other projects or because of a perception that they would add little to the project.

This book would be useful to new project leaders who have yet to be part of a cross-functional company team trying to re-engineer a process and the technology to support it. For those of us who have been there, it's all-too-familiar ground. ■



Book reviews are by Lollad Allen, a director at Tenon Consulting in Burlington, Mass. She can be reached at lollad@tenon.com.

when it comes to **building**

intranets

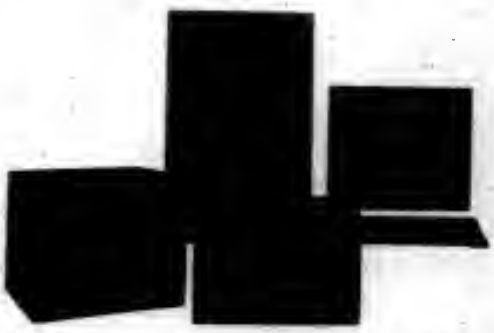
cabletron

is essential

Intranets improve productivity and reduce costs, but they need extra bandwidth and speed for web-based live video, voice and data access. SmartSwitches from Cabletron provide:

- *virtual routing and policy management with SecureFast Virtual Networking for flexible configuration and lower cost of ownership*
- *blazing fast 750,000 packets per second throughput from a custom ASIC design*
- *per-port RMON and built-in network trend and analysis tools for excellent manageability*
- *the industry's best service and support available worldwide*
- *a smooth migration path to future technology with Cabletron's Synthesis framework*

Make sure your network infrastructure can handle the traffic. Build your **intra**net from the right stuff. SmartSwitches from Cabletron. Call (603) 337-0910 to learn more.



Essentials include scalable, high-speed switches, an enterprise management platform and a true virtual networking solution.

The real Intranets product

CABLETRON SYSTEMS
The Complete Networking Solution™

Corporate: 35 Industrial Way, Rochester, NH 03867•**Fax:** (603) 337-2211•**Internet:** http://www.cabletron.com/

Announcing

bettersmarter

ways to
safely store all
the information
on the planet.

Somehow, the smaller the world gets, the more its information grows. Each day, networked computers are making more kinds of information available to more people than ever before. From daily stock market prices to weather maps to comic books, the information we generate is the lifeblood of business. And that makes the decision of how to manage and store it even more vital.

At IBM, we're constantly thinking of new ways to maximize the value of your information. Part of which means understanding that different kinds of information can have different kinds of storage needs. For some, the reliability of a 24-hour, seven-day-a-week system is absolutely critical. For others, having instantaneous access is key. And with rare exception, cost is always an important consideration.

If any of these concerns hit close to home or business, a recent arrangement with StorageTek,® a recognized storage provider, may interest

StorageTek is a registered trademark of Storage Technology Corp. IBM is a registered trademark and Solutions for a small planet is a trademark of IBM Corp. © 1996 IBM Corporation.

fastercheaper

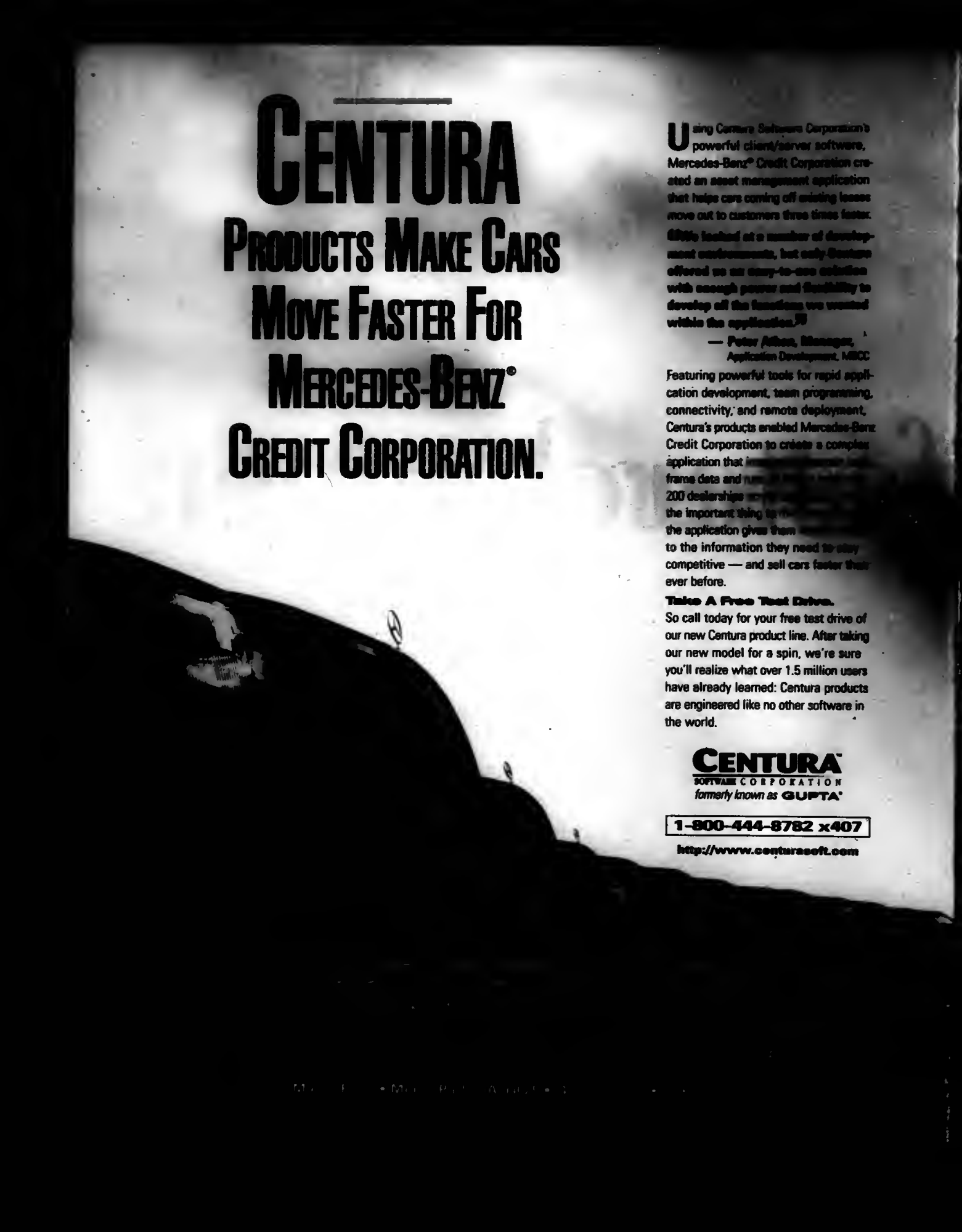
you. On June 10, an OEM agreement added a number of their disk storage systems to the growing IBM storage family.

These innovations, which will soon be available under the IBM name, give you an even greater range of price, performance and capacity variables to choose from. So we can accommodate – and even customize – storage solutions that can keep pace with the way you need to do business.

And we can manage it all with the IBM service and support that you've come to expect. Only better. Smarter. Faster. Cheaper.

To find out how we can help you get more out of storage, drop by www.storage.ibm.com/storage today.

Solutions for a small planet™ IBM


CENTURA
PRODUCTS MAKE CARS MOVE FASTER FOR MERCEDES-BENZ® CREDIT CORPORATION.
Using Centura Software Corporation's powerful client/server software, Mercedes-Benz® Credit Corporation created an asset management application that helps cars coming off existing leases move out to customers three times faster.
"We looked at a number of development environments, but only Centura offered us an easy-to-use solution with enough power and flexibility to develop all the functions we wanted within the application."
— Peter Allen, Manager, Application Development, MBCC
Featuring powerful tools for rapid application development, team programming, connectivity, and remote deployment, Centura's products enabled Mercedes-Benz Credit Corporation to create a complex application that
frame data and
200 dealerships
the important thing
the application gives them
to the information they need to stay competitive — and sell cars faster than ever before.
Take A Free Test Drive.
So call today for your free test drive of our new Centura product line. After taking our new model for a spin, we're sure you'll realize what over 1.5 million users have already learned: Centura products are engineered like no other software in the world.
CENTURA
SOFTWARE CORPORATION
formerly known as GUPTA
1-800-444-8782 x407
http://www.centurasoft.com

Buyer's Guide



Editor's note



A new wave of Pentium Pro-based machines is hitting the market. These packages of up to four 166-MHz CPU chips bring PC server technology to a new level. They can churn complex transaction processing and decision-support applications almost as fast as minicomputers that were designed specifically for such tasks. In this Buyer's Guide, we try to give information systems managers a sense of what they stand to gain from four-way 166-MHz Pentium Pro-based servers.

In our comparison of machines from four vendors, we found that each has good points and not-so-good points. But it's clear that the servers as a group represent a step up in terms of performance and configurability.

Now that the 166-MHz machines are available, it's time to think about the next stage: 200-MHz Pentium Pro-based servers, larger cache sizes and a new generation of Pentium Pro-based machines that run at 266 MHz and 300 MHz (see story, page 98). For now, though, here's a look at the four-way machines.

— James Connolly
Technology Evaluations Editor
James_connolly@cw.com

new Pentium Pros pack a punch

PC servers push their way into the midrange; HP scores best performance numbers

For years, information systems managers have been promised inexpensive PC servers that could match the performance and manageability of proprietary midrange systems. A new generation of servers based on Intel Corp.'s Pentium Pro chip has brought that day within view.

We reviewed four similar servers that validate the dawn of this new generation. An evaluation of the Revolution Quad 6 from Advanced Logic Research, Inc. (ALR), the Proliant 5000 from Compaq Computer Corp., the NetServer LX Pro from Hewlett-Packard Co. and the PC Server 704 from IBM indicates that Intel-processor systems have reached a new level of maturity. Each of the four servers provides performance comparable to — and in one case equal to — typical midrange systems such as IBM's AS/400 Model 2020. Each tested computer is the latest and most powerful system of its type available from the vendor.

Computerworld chose the computers based on a list of market and technology leaders gleaned from analysts' recommendations. Some companies on the list had configurations in development similar to those tested but weren't able to provide hardware in time for the evaluation.

By Curtis F. Franklin Jr.

With the exception of the ALR computer, none of the systems was available for purchase at the time of the evaluation. For this reason, documentation wasn't considered a feature for comparison. The state of the three prerelease machines varied from very polished to rather preliminary, but all provided valuable insight into the likely performance characteristics of the final systems.

On your (bench)mark...

We compared the systems' performances by using the RPMark 95 benchmark (see RPMark box, page 95). This benchmark places loads of decision support, online transaction processing and file-serving transactions on a server simultaneously. The RPMark 95 scores are relative performance ratings based on the number of operations performed per min-

Pentium Pros, *page 94*

Who's here?

HP edges ahead

RPMark 95 test scores

	HP	Compaq	ALR	IBM
Decision support systems	433.3	808.0	774.7	827.3
Online transaction processing	465.4	866.1	811.0	808.1
[illegible]	423.3	444.5	443.7	429.8
RPMark 95	431.3	404.4	387.7	379.2

Pentium Pros

CONTINUED FROM PAGE 93

ute compared with a baseline index defined by Client/Server Labs, Inc. in Atlanta.

All systems were tested under Microsoft Corp. Windows NT 3.51 and Microsoft SQL Server 6.0.

The systems that were evaluated shared several key features. Each arrived with four 166-MHz Pentium Pro processors, and each processor had 512K bytes of Level 2 cache.

Each system was evaluated with fast and wide SCSI-2 storage adapters, hot-swap internal hard disk drives and at least 256M bytes of memory.

All the systems provided for expansion through Peripheral Component Interconnect (PCI) and Extended Industry Standard Architecture (EISA) buses.

And each machine was equipped with systems management software designed to make large-installation management possible.

In seeking to identify the benefits users may gain from the new generation of Pentium Pro servers, and the differences among systems from leading vendors, *Computerworld* solicited recommendations from several analysts who identified the vendors most likely to be of interest to corporate IS managers. The analysts based their recommendations on market presence and the technical capabilities of the vendors.

Test facility Client/Server Labs, Inc. in Atlanta was commissioned to request four-processor 166-MHz Pentium Pro servers from the recommended vendors. Several vendors reported they wouldn't have systems available in time for this review. Client/Server Labs tested the four systems that were available.

Contacting the vendors

Advanced Logic Research, Inc.
Irvine, Calif.
(800) 444-4357
www.alr.com

Compaq Computer Corp.
Houston, Texas
(800) 345-1518
www.compaq.com

Hewlett-Packard Co.
Palo Alto, Calif.
(800) 752-0900
www.hp.com

IBM
Armonk, N.Y.
(800) 426-3333
www.ibm.com



ALR Revolution Quad 6

Price/performance leader, but not a top-tier vendor

If price/performance ratio is the primary focus of a decision, then ALR's Revolution Quad 6 is the leading candidate. With hardware that costs less than $40,000 and a performance rating that is 90% of the leader's, the Revolution Quad 6 has the best price/performance ratio of any of the systems tested.

ALR designed the Revolution Quad 6 with significant internal expansion capabilities. There are 15 expansion slots — seven PCI, seven EISA and one shared. Storage can be expanded through 12 internal drive bays, and an additional 15 hot-swap bays are optional. Memory can be mixed to 2G bytes of error-checking and correcting (ECC) RAM.

Continued operation is enhanced through the availability of dual power supplies, though they are powered through one cord. ALR's fault-manager software works through the system console and an LCD touch panel that provides information on power, component and environmental parameters.

The Revolution Quad 6 turned in an overall performance of 387.7 points on the RPMark 95 benchmark, third out of the four systems tested for this evaluation.



Compaq Proliant 5000

Good external expansion capability, limited internal capacity

While the other systems in this evaluation were designed to maximize internal expansion capabilities, Compaq designed the $59,595 Proliant 5000 to take advantage of external enclosures for storage expansion and other flexible slot-based adapter expansion. The Proliant 5000 has only four internal drive bays — the system that was tested for this article came with two external drive enclosures. The system provides nine expansion slots — five PCI, one EISA and three combination slots. The PCI slots are divided between two buses, which allows for increased throughput.

Compaq's Proliant 5000, scheduled for introduction today, can be equipped with up to 2G bytes of ECC RAM through dual in-line memory module expansion. It was the only system that arrived for the evaluation with dual-package modules. The system can be equipped with dual power supplies and, of course, each drive cabinet has a separate power supply.

Compaq's Insight Manager software can notify a manager about a hardware component [illegible] before actual failure occurs. [illegible] designed to prevent [illegible]

The [illegible] system.

But beyond the basics, features and implementation made for significant differences among the systems.

A look at the bottom line

The tests showed that performance of the four systems is clustered in a relatively tight band, although the HP system stood out from the others in overall performance.

The HP computer's performance puts it on a par with recent AS/400 benchmark numbers. From a price/performance standpoint, the ALR system was the clear winner.

The Compaq and IBM computers were competent performers but had neither displayed the compelling performance of the Hewlett-Packard machine nor the outstanding affordability of the ALR product. ■

Franklin is lab director at Client/Server Labs, Inc. in Atlanta.

The RPMark 95 Benchmark

The systems for this evaluation were benchmarked using RPMark 95, a test designed to indicate the performance of a server configuration under the type of multiapplication load frequently seen in the business environment. The benchmark places three application loads — online transaction processing, decision support and file serving — on the server at the same time. Scores represent each system's performance relative to a reference rate defined by the benchmark. The final RPMark 95 score is a geometric mean of scores for multiple runs. For more information about RPMark 95 and Client/Server Labs, see www.cslinc.com or call (770) 552-3645.



Hewlett-Packard NetServer LX Pro

Exceptional power, but at a price

When it entered the Pentium Pro-based symmetrical multiprocessor server market, HP designed its NetServer LX Pro with attention to the details necessary to enable ready management and configuration of the server. Features such as top-side access to the 10 expansion slots and HP's NetServer Navigator software make the NetServer LX Pro the most convenient to change and configure. The system's performance, which topped the field, makes its $65,000 price for the tested hardware configuration more palatable.

Like the ProSignia 5000, the NetServer LX Pro's PCI slots are divided between two buses. In addition to the six PCI slots, the HP provides four EISA slots for expansion. No slots are shared between the two bus types. Twelve hot-swap drive bays allow up to 108G bytes of internal storage using current technology. It has 2G bytes of ECC memory. All this is offered on Intel system boards that are protected by three power supplies. By comparison, the IBM and ALR computers each depended on two power supplies, and the Compaq was tested with a single supply, though a redundant power supply is optional.

The NetServer LX Pro, scheduled to ship in a month, received 431.3 on the RPMark 95 benchmark, topping the field by a considerable margin. The HP system scored nearly 100 points more than its nearest competitor in decision-support and online transaction-processing components. This indicates that the storage interface and devices are well matched to the rest of the system.



IBM PC Server

Smooth power with [illegible] rough edges

Of the four systems tested in this evaluation, the IBM PC Server 704, which costs $54,310, was received in the earliest stage of its life cycle. There were small indications of its preproduction status, such as the hand-assembled condition of the case. Larger signs included the unmitigated differences in performance between the IBM and HP computers, even though they share a common set of Intel system boards.

Like the HP and ALR systems, the PC Server 704 has significant room for internal expansion, including six PCI and four EISA slots, 12 hot-swap drive bays and up to 1G byte of ECC memory. There are two power supplies with two cords; a third power supply is optional.

IBM's NetFinity management software is included with the PC Server 704, which allows for ready management of hardware and software components.

The IBM system had the lowest number on the RPMark 95 benchmarks run for the evaluation (see test results, page 94), although it was essentially equal in performance to the ALR and Compaq computers. IBM indicated that tuning remained to be done on the system before its general availability. It will be interesting to see how much performance improvement is gained.

Why SQL Server 6.0?

At the time of this evaluation, Microsoft Corp.'s SQL Server 6.5 database management system had been generally available for less than a month.

Though several benchmark results have been announced that used SQL Server 6.5, there are many differences in the tuning parameters between Version 6.0 and Version 6.5.

Indications are that the newer version of SQL Server will show improved performance compared with Version 6.0, especially under online transaction processing applications. But moving a server from Version 6.0 to 6.5 involves far more than simply loading the new version and restarting the application.

Officials at Client/Server Labs and editors at *Computerworld* decided to test the four Pentium Pro-based servers by using the earlier version of SQL Server so the issue of tuning a new version of the database manager wouldn't arise with this review.

Several of the vendors covered in this feature, including Oracle Corp. and Microsoft, have released their own benchmark results that used different DBMSes.

WE WERE FLATTERED.

Oracle was an early and extremely demanding customer. Extremely demanding. Because AlphaServer systems exceed their expectations every time.

"Oracle was the first database vendor to exploit our VLM64 very large memory technology. It's really gratifying to see them now reaping the benefits.

Earl Joseph
Digital VP AlphaServers

Oracle knows excellence when it sees it. And when Oracle chooses to deploy their most critical applications on the AlphaServer platform it is a tremendous endorsement. We're truly flattered."

Robert A. Wayman
Executive Vice President & CFO



DIGITAL IS PROUD TO ANNOUNCE THAT ORACLE IS RUNNING ITS

WE WERE FLOORED.

"Oracle is growing at a phenomenal rate. We need systems that can stay ahead of us, and our first AlphaServer tests were incredible. We were floored. It was a purchase decision that made itself."

Lawrence J. Ellison
Oracle Chairman & CEO

"Better, faster, cheaper. Those are my favorite words, and the AlphaServer systems are delivering on all counts. They've given our financial systems the added capacity and performance we needed. We're extremely pleased."

Jeffrey Henley
Oracle CFO & Executive VP

"To install a totally new e-mail system for hundreds of users over a weekend and have it just run, our AlphaServer conversion was the smoothest we ever saw. It's now supporting thousands of users."

Gerald J. Corvino
Oracle CIO & Sr. VP



CORE BUSINESS APPLICATIONS ON THE 64-BIT ALPHASERVER 8400.

digital

Up to the minute

Here's a quick look at some recent Pentium Pro-related announcements:

- Compaq Computer Corp. announced Proliant 5000, a high-end Pentium Pro-based quad-processor-capable server. Audited TPC-C benchmarks revealed that the Proliant 5000, which is powered by four 166-MHz Pentium Pro processors, delivered mid-range-level performance of 5676 tpmC with an industry-leading price/performance value of $336/tpmC. The company also introduced the ProSignia 300 5/150 workgroup file/print server, which integrates the 150-MHz Pentium processor.
- Stratus Computer, Inc. delivered the industry's first fault-tolerant, high-availability multimode Windows NT server cluster that supports Pentium and Pentium Pro technology.
- Digital Equipment Corp. unveiled the Prioris 6000ZX at Comdex/Spring '96.
- IBM shipped PC Server 704.
- Hewlett-Packard Co. announced the midrange NetServer LM Pro, which is set to ship by year's end, and the high-end NetServer LX Pro, the VA and XA, which is due next month. It also unveiled two Vectra PCs based on Intel's 180- and 200-MHz Pentium Pro processors.
- Dell Computer Corp., IBM PC Co., HP and Gateway 2000, Inc. demonstrated systems that use powerful processors when Intel announced its 200-MHz chip early this month.
- Netpower, Inc. unveiled its four-processor Pentium Pro Sparta server based on Windows NT.

You'll get still more for less

Design efficiencies, competition should let users buy more server power at lower prices

In the next year, buyers will find a lot of good news wrapped in Pentium Pro-based server boxes.

Heavy competition among vendors and a server-friendly chip design should nudge systems prices down and improve performance and availability features, according to analysts and other industry observers.

Two- and four-way symmetrical multiprocessing (SMP) designs will step forward as the preferred platforms for workgroup and enterprise LANs that rely on Unix, Novell, Inc.'s NetWare 4.0 and Microsoft Corp.'s Windows NT, analysts say.

BY STEVE BOSAK

The Pentium Pro seems to have remedied server design problems inherent in the original Pentium architecture.

To exploit the Pentium for server work, especially in multiprocessor configurations, secondary cache and processor-to-Peripheral Component Interconnect chip set architectures had to be custom-designed. As a result, four-way Pentium servers were late arriving and, in many cases, more expensive than anticipated. The Pentium Pro, on the other hand, was designed to be "server friendly," with on-board secondary cache and high-speed 66-MHz bus support built on the chip. Though the Pentium Pro comes in 133-, 166- and 200-MHz speeds, only the 166- and 200-MHz chips come with 512K bytes of Level 2 cache that run at the same speed as the processor.

An Intel Corp. spokesperson says this extra high-speed cache is essential in multiprocessor server configurations for storing memory segment addresses and directing I/O traffic more efficiently.

Next generation

Higher-speed versions of the Pentium Pro that run at 266 MHz and 300 MHz are expected late this year or early next year, according to analysts and news reports. Chips above 300 MHz will fill in performance gaps until Intel releases its P7 processor, code-named Merced, sometime in 1998. The P7, in initial design stages now, will be a hybrid RISC/CISC processor, with full 64-bit addressing, system bus and memory support.

In a strategy shift, Intel is designing and shipping complete motherboards to server vendors. The only design decisions left for most server manufacturers are the selection of disks and power supplies and the addition of high-availability features. With little to differentiate these Intel motherboard systems in raw performance, look for vendors to tout RAID and other redundant components, server management software and aggressive pricing as competitive advantages.

While mass-market PC manufacturers now have an easier entry into the production of four-processor servers, superserver manufacturers feel the pressure.

Companies such as Netframe Systems, Inc., Tricord Systems, Inc. and Chen Systems, Inc., seen as providers of custom-designed, high-performance servers, face the challenge of moving their designs even further upscale.

"With the Pentium Pro design, Intel has incorporated many features where we used to spend a huge chunk of our development money. Now we can spend it elsewhere — in improving system bus speeds, developing high-speed Level 3 cache systems and delivering eight-way SMP systems," says Cory Devor, vice president of systems development at Tricord. ■

Bosak is a freelance technology writer in Batavia, Ill.

Buyer advisory: Let others take chances

By Kevin Burden

If you plan to buy a Pentium Pro-based server, analysts advise being conservative and choosing a seasoned server vendor that knows what to do the instant the server crashes.

Safe bets are market leaders such as IBM, Compaq Computer Corp. and Hewlett-Packard Co.

If you need this much horsepower from a server, chances are you run critical applications that require high availability. "That's why you should default to leading vendors who know about reliability and serviceability," says Jon Oltsik, an analyst at Forrester Research, Inc. in Cambridge, Mass.



Source: Dataquest, San Jose, Calif.

Buyer beware

Don't be seduced by a low price, Oltsik says. That warning may be cliched, he says, but the trap is easy to fall into with standards-based systems. After all, with Intel Corp.'s engineering at the heart of every server in this class, the common perception that you'll get a quality box even from lower-tier vendors is correct, Oltsik says. But there are enough differences among the systems to make the decision difficult.

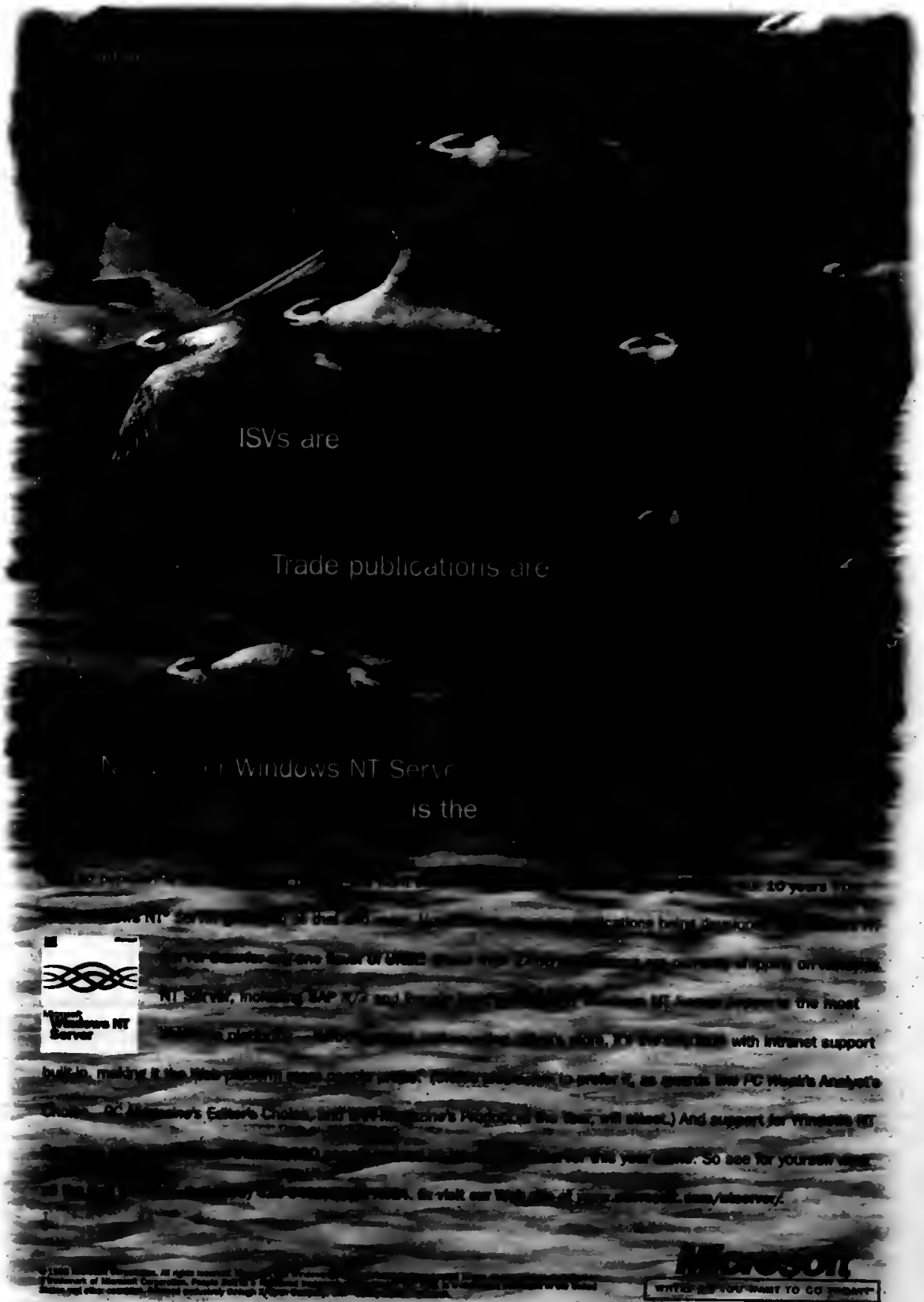
For example, several vendors have opted to design their own motherboards instead of using Intel's stock board, according to Jerry Sheridan, director and principal analyst at Dataquest in San Jose, Calif. These vendors can provide improvements and special features above and beyond what is offered by Intel. What's missing is the Intel motherboard, which will be the standard, Oltsik says. "We tell clients, 'Let other people be the guinea pigs.' Even though some vendors will re-engineer something better in the short term, it will be obsolete in the long term," Oltsik says. But if Intel inadequacies, such as small cache, can't be tolerated, the lure of architecture improvements may be too great.

Still, Oltsik says, "If everything you need isn't wrapped into Intel's architecture today, it certainly will be over time." Intel's current standard is 1M byte of cache, which should be configurable in the near future.

Users should pay particular attention to the differences in software, not hardware, Oltsik says. "The value added is the systems management software included with the server," he says. "And it's not just which management package. It's how the vendor enhanced it and how well it fits in to your own distributed network."

This is another reason to stick to leading vendors that know about servers that gracefully fit in to networks. "The less common they are, the more work they are. So while up-front cost may be low, over time cost will be higher," Oltsik says. ■

Burden is *Computerworld*'s senior researcher, Scorecard/Firing Line.


ISVs are
Trade publications are
Windows NT Serve
is the





Superior automated back-up and restore from the world's largest manufacturer of 8mm tape libraries.

Some things are hard to believe. Like disasters and total data loss. But these things happen; there's documented proof. If it ever happens to you, an Exabyte 8mm tape library will restore your data faster than you can say "mission critical."

Exabyte libraries employ sophisticated technology, like intelligent robotics and multiple drives working in parallel, to ensure fully automated back-up and rapid file retrieval. Our modular, field-replaceable-unit design yields maximum uptime. And when equipped with our new Mammoth drive, a single library can store from 140 gigabytes up to 3.2 terabytes of data at a transfer rate up to 86.4 GB/hr.*

As the leader in 8mm technology, we've designed our libraries to be compatible with 60 software applications across all client/server platforms. And Exabyte is the only manufacturer to design all the components in a family of libraries; these include drives, media and robotics. Our tape library expertise eases integration, assures a clear upgrade path, and delivers superior performance, all at just pennies per megabyte.

Capacity, performance, reliability, and fully automated back-up: It all adds up to peace of mind that's, well, unbelievable.



Call 1-800-EXABYTE for your free storage automation planner.

EXABYTE®

http://www.exabyte.com

*2:1 compression ©1998 Exabyte Corporation. Exabyte is a registered trademark of Exabyte Corporation, 1685 38th Street, Boulder, Colorado, 80301 USA.

In Depth







By Robert S. Arnold

Think you know your year 2000 issues inside and out? Then step right up, and test your conceptions (or are they misconceptions?) about the problem and the solutions.

So you say you've got a handle on the year 2000. Are you proceeding based on a firm knowledge of facts about the problem, software maintenance, software testing and impact analysis? Does your hired help know all this, too? We'll see about that.

Answer the following. In multiple-choice questions, pick only one response. In yes/no and true/false questions, choose the response you think is proper most of the time. You'll find the answers and explanations on page 102.

QUESTIONS

1 What calendar does the U.S. public most commonly use?
Julian
Gregorian
Lunar

2 Jan. 1, 2000, falls on a
Tuesday
Friday
Saturday
Sunday

3 Which of the following are leap years? (Hint: There's more than one correct response.)
1900
1982
1988
1990
2000
2004

4 Year 2000 problems can occur only on or after the first day of 2000.
True
False

5 What is the best representation for a date?
DDMMYY
DDMMCCYY (CC means century: 19 or 20, for example)
Current International Standards Organization (ISO) standard
Current American National Standards Institute (ANSI) standard
Date abstract data type (or a date class in object-oriented terminology)
Other

6 Year 2000 problems are a subset of software maintenance problems.
True
False

7 In program maintenance, most errors are found relatively early in each release cycle.
True
False

8 Impact-analysis tools find all possible impacts to a program.
True
False

9 You run an impact-analysis tool on your code. It predicts that 60% of your code is affected. Does that mean you will need to change 60% of your code to accomplish the change?
Yes
No

10 An impact-analysis tool or service predicts that your year 2000 project will take nine person-years. Should you accept this estimate as accurate?
Yes
No
Unknown

11 In general, testing can show that a program contains no errors.
True
False

12 If a program does nothing that is date-oriented, can it still bomb because of a year 2000 problem?
Yes
No

13 A program is tested; no errors occur. Should you consider the program free of year 2000-related errors?
Yes
No
More checking is needed

Quiz Show 2000, *page 102*



CONTINUED FROM PAGE 101

ANSWERS

1 Gregorian

2 Saturday
It's a good thing, too. Hopefully revelers won't be using their computers very much, so residual year 2000 problems won't bite people then. But be prepared to come to work Jan. 2 in case new problems surface Jan. 1.

3 1988, 2000 and 2004 are leap years.
A leap year is a year that is either divisible by four but not by 100 or is divisible by 400.

Years 1982 and 1990 aren't divisible by four or 400, so they aren't leap years. Year 1900 isn't a leap year because it's divisible by 100 and not divisible by 400. Year 2000 is a leap year because it's divisible by 400.

The leap year rule is tricky. That's why you should check that your date calculation routines correctly implement it. If the rule is tough for you now, what about the programmer who inserted it in your code 20 years ago?

4 False
These problems have already occurred because they are based on the assumption of a two-digit year field, and dates beyond 2000 have already entered some systems' processing streams. Some two-digit 21st-century years have already appeared in programs, causing problems such as automatic deletion of data by programs that thought data suddenly became many years older.

5 Data abstract data type (or a date class in object-oriented terminology)
"Best" is a loaded word. In general, the date class approach is most useful from a maintenance standpoint. Think of a date class as a collection of subroutines that operate on dates whose representation is known only by those subroutines, not the programs that call the subroutines.

Here's why date classes lend themselves to maintenance. With a date class, the internal representation of the date can be "hidden" – other programs can get at date information only through the subroutines provided by the date class. If you change the date representation (for instance, if you expand years from two digits to four) but preserve the syntax and meaning of the date class subroutine interfaces, you may be able to reduce your date conversion changes to just the date class. (To be on the safe side, there are other areas to check. Most systems aren't designed to make the century date change conversion this simple.) That's a big plus in finding where to make changes and minimizing the ripple effect.

If, the most of us, you're not using an object-oriented language, you can approximate the date-class idea through programming discipline. For example, you can create a project library with your own set of date subroutines and mandate that only these routines be used to handle date information.

If you don't implement these suggestions, you may be forced to a lower level, where you must detail the lengths and positions of days, months and years. Here the choice of date representation isn't so simple. Standardization of some kind is in order. Picking an official standard date representation, such as one from ANSI or ISO, is one possibility. But if you already have an internal de facto standard such as YYMMDD, it may be best to leave well enough alone.

6 True
Though year 2000 problems can occur in software development, they are most commonly found now during software maintenance.

7 True
One IBM study by Edward Adams about maintenance fixes showed that in two out of three releases, most errors appeared to be found in the first half of the release cycle.

For year 2000 projects, you can view problem removal as a maintenance release. Watch for the need to make changes shortly after year 2000 fixes become available from your company or someone else's. What's pernicious is that though some year 2000 problems are easy to fix, their repercussions can be devastating. For example, imagine recalculating and issuing corrections for half a million retirement benefits checks.

8 False
An impact-analysis tool estimates what software items are affected by changes to a program. To do this, it uses certain relationships, called dependencies, that model how software parts affect one another. Only a limited number of relationship types are used. That's why you should combine impact analysis with other validation techniques.

9 No
You probably don't need to change 80% of your code because many year 2000 solutions require that only a small fraction of code be changed. That doesn't mean finding, making and certifying the changes won't be time-consuming.

10 Unknown
Little validated empirical data has been collected. Validated means someone has independently taken the collected data and checked its accuracy. The bottom line for cost models is how closely their predictions match reality. Without clear data on reality, this is difficult to show.

As a practical matter, having a highly accurate estimate may not be as important as having one that is defensible and convincing. One way to do this is with activity-based costing, with which you create detailed change processes and carefully cost them out, making sure major cost drivers are accounted for.

11 False
Remember the famous comment of Edsger Dijkstra, computer science and software engineering pioneer. He said testing can show only the presence of errors, not their absence. Because you can only run a subset of all possible test cases, it is possible that test cases you haven't run could reveal errors.

12 Yes
A program that isn't date-oriented can use other programs that use date-oriented information. Errors here can ripple back to the program, causing weird results.

The program may also use date-oriented data. Inconsistencies here (for instance, some year fields are two digits and some are four) can cause problems.

13 No
Again, testing is a safety net that raises confidence in a program. But don't ask of testing what it can't deliver. The Adams study on maintenance fixes, for example, reported that there are some errors that will likely never be found in a product's maintenance lifetime.

SCORING

11 – 13: Expert
9 – 10: Well-informed
7 – 8: Expected
6 or lower: You may want to brush up on program validation, impact analysis and software maintenance.

Nothing is more uncomfortable than discovering your server is too small.



You buy a server, your company grows; you buy another server, your company grows. It's time to break this vicious cycle. Introducing the Sun™ Ultra™ Enterprise™ Servers. The mainframe-caliber servers designed to grow as your company grows—without the usual cramps or compromises. Whatever your business needs, whether it's multiple-terabyte data warehouses or the ability to support thousands of users, Sun delivers. Best of all, you'll never wake up crammed in to a corner. Modular, scalable design lets you add CPUs and pump up I/O bandwidth as needed. Redundant, hot-swappable components, along with round-the-clock service and support, deliver the reliability to keep your mission-critical applications up and running. All of which adds up to enough network computing power to cover your entire business, no matter how quickly it grows. Sun Ultra Enterprise Servers. They're every reason you bought a mainframe, and every reason you didn't. To learn more, contact Sun at http://www.sun.com or call 1-800-786-0785, Ext. 390

Sun

THE NETWORK IS THE COMPUTER™

© 1996 SUN MICROSYSTEMS, INC. ALL RIGHTS RESERVED. SUN, SUN MICROSYSTEMS, THE SUN LOGO, ULTRA, ULTRA ENTERPRISE, AND THE NETWORK IS THE COMPUTER ARE TRADEMARKS OR REGISTERED TRADEMARKS OF SUN MICROSYSTEMS, INC. IN THE UNITED STATES AND OTHER COUNTRIES

Coming in Computerworld's
June 24th issue...





Your corporate intranet – how are you going to manage it?
Technology shifts always produce info-gluts – tons and tons of reports, product announcements, articles.
What's it all mean? *Find out each month with* Computerworld Intranets, *the manager's guide to what's really important.*

● **A MONTHLY MINI-MAGAZINE:**

You'll get information on how you can put Web browsers and other standard Internet technology to work in your internal company networks. Once a month in *Computerworld* we bring you a "mini-magazine" of highly focused pages that examine the critical intranet management issues you need to know.



www.computerworld.com/intranets



● **ONLINE:**

For expanded practical advice and information that includes checklists, project plans, RealAudio interviews with other high-level managers and links to the best Internet resources. Plus interactive forums and polls to help you find the best ideas and techniques while building your intranet.

IN THE JUNE 24TH DEBUT ISSUE:

- **Analysis:** Early payoffs look good. But IS must find better ways of demonstrating their intranet value
- **Projects:** Trans Ocean Ltd. piggybacks an intranet on its home page.
- **Explainer:** What intranets are and what they can do for organizations.
- **Plus:** Advice from leading consultants. Best new intranet reports, conferences, resources.

TO REQUEST ADDITIONAL PRINT COPIES:

- **Contact:** Sharon Bryant,
  Computerworld Reprints Manager
  Tel: (508) 820-8125
  Fax: (508) 875-0733
  E-mail: sharon_bryant@cw.com.

Copies of *Computerworld Intranets* articles are available for $4 each plus postage.

Published by:

COMPUTERWORLD
Everything you need to know.

Sponsored by:

NETSCAPE

...and its business partners:

INFORMIX®

Sun

COMPUTERWORLD

Professional Courtesy Voucher

❑ **Yes**, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of $39.95* per year - a savings of $8.05 off the basic subscription price.

First Name MI Last Name

Title

Company

Address

City State Zip

Address shown: ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate: $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars. For faster service, fax your order to (508) 626-2705.

SAVINGS STATEMENT

Regular Subscription Price
$48.00

Your Special Price
$39.95

Your Savings
$8.05

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
69. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/ Distributor/Reseller
99. Other_____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Assistant VP IS/MIS/DP Mgmt.
21. Director/Mgr. MIS Services, Info. Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech. Planning, Administrative Services
23. Dir./Mgr. Sys. Development, Systems Architecture
31. Programming Mgmt., Software Developers
41. Engineering, Scientific, R&D Tech. Mgmt.
20. Sys. Integrators/VARs/Consulting Mgmt.

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Assistant VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Marketing Mgmt.
70. Medical, Legal, Accounting Mgmt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Dev. Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1. At this location	2. Entire Organization
A. 20,000 +	❑	❑
B. 10,000 – 19,999	❑	❑
C. 5,000 – 9,999	❑	❑
D. 1,000 – 4,999	❑	❑
E. 500 – 999	❑	❑
F. 100 – 499	❑	❑
G. 50 – 99	❑	❑
H. 20 – 49	❑	❑
J. 10 – 19	❑	❑
K. 1 – 9	❑	❑

B466 5

COMPUTERWORLD

Professional Courtesy Voucher

❑ **Yes**, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of $39.95* per year - a savings of $8.05 off the basic subscription price.

First Name MI Last Name

Title

Company

Address

City State Zip

Address shown: ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate: $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars. For faster service, fax your order to (508) 626-2705.

SAVINGS STATEMENT

Regular Subscription Price
$48.00

Your Special Price
$39.95

Your Savings
$8.05

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medical/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
69. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/ Distributor/Reseller
99. Other_____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Assistant VP IS/MIS/DP Mgmt.
21. Director/Mgr. MIS Services, Info. Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech. Planning, Administrative Services
23. Dir./Mgr. Sys. Development, Systems Architecture
31. Programming Mgmt., Software Developers
41. Engineering, Scientific, R&D Tech. Mgmt.
20. Sys. Integrators/VARs/Consulting Mgmt.

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Assistant VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Marketing Mgmt.
70. Medical, Legal, Accounting Mgmt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Dev. Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1. At this location	2. Entire Organization
A. 20,000 +	❑	❑
B. 10,000 – 19,999	❑	❑
C. 5,000 – 9,999	❑	❑
D. 1,000 – 4,999	❑	❑
E. 500 – 999	❑	❑
F. 100 – 499	❑	❑
G. 50 – 99	❑	❑
H. 20 – 49	❑	❑
J. 10 – 19	❑	❑
K. 1 – 9	❑	❑

B466 5

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144



Eric Yahnker

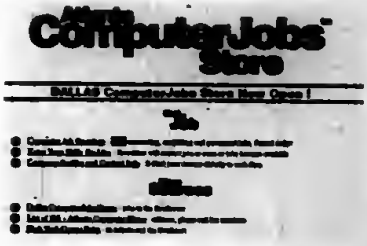
Web sites for career-minded IS professionals / By Leslie Goff

JOB SURFING!

The Atlanta (and Dallas) Computer Jobs Store(s) www.ComputerJobs.com/ (and www.ComputerJobs.com/Dallas/)

If you want to check out the local job market for information systems professionals in the Southeast or Southwest, these twin sites make a good starting point for finding and contacting potential employers. Each offers a database of available full-time and contract positions, employer profiles, online submission of a skills profile and a Career Help section.

Job postings, updated daily, are sensibly categorized by IS function and tell you what you want to know: a description of the job, skills requirements, start date, salary and so on. Most contain an electronic-mail link to the job contact, and filling out the skills profile form automatically places your information into a database that is accessible by registered employers.



The Atlanta "store" is better developed; it posts between 300 and 400 jobs daily. It features a localized Career Help section that offers information on area IS job market trends and regional health insurance options for IS contractors. The Dallas store, which went online in May, had 61 jobs posted within the first few weeks. But it offered only three employers, all consulting firms, and the Career Help section wasn't localized enough to be truly helpful.

Career Mosaic www.careermosaic.com/

While this is a general job search site; it is, nevertheless, a good resource for IS pros. The reason: A wealth of high-caliber employers use it to recruit job candidates. They include MassMutual Insurance Co., Toys R Us, Inc., Miller Brewing Co., Price Waterhouse and nearly all the major Silicon Valley firms. The J.O.B.S. Database lets you search by any combination of job description, title, company and location: Breadth or depth, it is up to you.

Typing in "information systems," "business analyst" and "New York" yielded a reinsurance systems job at an insurance underwriter, and "information systems," "programmer/analyst" and "Chicago" brought back two financial systems jobs at a food company. Each job posting contains an automatic response form, and, separately, you can post your resume online. A Usenet search engine also accesses job postings from the main newsgroups.

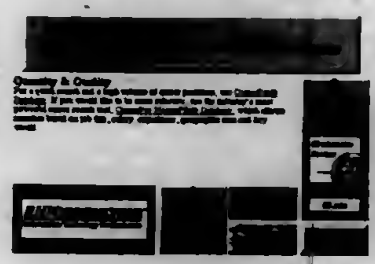


The alphabetically organized employer database links to either a CareerMosaic-based page or to the employer's own home page — taking you out of the CareerMosaic site — or to both. It would better serve users if it were cross-referenced by industry segment or location, or both. The Career Resource Center is comprehensive and worth perusing, but skip the Online Job Fairs section unless you want to link to the Virtual Job Fair site, reviewed below.

ESPAN www.espan.com/

This job matching service site is good for several reasons. But it has one unique feature that makes it worth bookmarking for those days when the only place you want to be is somewhere else: a relocation salary calculator.

Type in your present salary, location and your destination, and find out precisely how much more or less you'll need to earn to maintain your standard of living. If you get by on $50,000 a year in New York, you'll need only $23,275 to make it in Memphis. It also contains a salary guide for IS pros that breaks the information down by position, region and city.



The real reason to visit this site, however, is to look for jobs. If you register as a member — the service is free — each time you log on, you will see only the jobs that match your user profile and resume. And if you can't log on every day, you can tell the system to E-mail you when matches are found. If you prefer to remain unregistered, this is still an effective place to job hunt. While the service is not IS-specific, it is heavy on IS jobs, and it employs two flexible search engines. Typing "information and systems" garnered about 50 hits, most of which were valid IS positions. A few engineering jobs popped up as well.

Amoco Co., Bank One Corp. and Westinghouse Electric Corp. are among the heavy-hitter employers here. But the majority of employers listed here are consulting firms. To its credit, ESpan doesn't attempt to disguise the fact that it is supported by advertising fees paid by the listed employers.

A Virtual Job Fair www.vjf.com/

Don't let the name of this site conjure up images of a simulated show floor that features virtual booths you can visit with a point and a click (hey, that would be fun!). The home page boasts some snazzy outer space graphics. But this site, aimed specifically at high-tech job seekers, serves the same basic function as the other job search sites. It claims to list 15,000 jobs at more than 500 companies, which you can search by keywords, including job title, technology, location or company — but not industry. A search for "programmer" yielded 91 responses.



You can also submit your resume online, simply by clicking on a box. The Resume Center here lets you post your resume either in a public or private database, which is both worthwhile and unique among job search sites. Employers scanning the private database won't see your private information, instead, they E-mail the site, which forwards the message to you. The High-Tech Careers magazine here could use more focus, but scan the archived articles for workplace advice if you have a few extra minutes before moving on to your next

For more surf sites, check out Practical Internet sites for IS, page 86.

Goff is a freelance writer in New York.

UNLOCK THE FUTURE.



Information Technology Professionals

Immediate Opportunities in the Tampa Bay Area!

Tech Data Corporation is much more than one of the world's fastest growing and most successful distributors of personal computer products. As a Fortune 500 company, Tech Data Corporation consistently delivers tremendous growth— with over $3 billion in sales last year alone. We recently received the honor of being ranked #22 in ComputerWorld's 100 Best Places To Work annual issue.

Tech Data's success can be attributed to our tremendous commitment to technology— it's the driving force behind everything we do. We offer an environment rich in technology— with opportunities existing from operations to directorship-level positions in technologies ranging from client/server to IBM mainframe and LAN/WAN technologies to voice data telecommunications. Current opportunities and technologies include:

OPPORTUNITIES:

- Programmer, Programmer/Analysts & Senior Programmer/Analysts
- Business Analysts/BR Coordinator (Electronic Commerce)
- Mainframe & Micro Database Administrators
- Web Developer
- Disaster Recovery Analyst
- Pre-Sales Network Engineers

TECHNOLOGIES:

- BCS
- Visual Basic
- SQL
- TCP/IP
- OOS
- Visual C++
- OOD
- COBOL
- Windows NT
- OLE
- DB2
- MFC
- LAN/WAN

You will enjoy competitive compensation, comprehensive benefits, and living on the Gulf Coast of Florida in the Tampa Bay area. Here, the cost of living is low, the standard of living is exceptional, scenic Gulf beaches are minutes away, and you will receive the added bonus of no state income tax.

Additional opportunities may also be available. Inquiries of all levels are encouraged. Please forward resume with salary requirements to: TECH DATA CORPORATION, Human Resources, Code JBJC, 5350 Tech Data Drive, Clearwater, FL 34620; fax (813) 538-7864; e-mail in ASCII or text format to: tdata.hades.com. Pre-employment drug testing required. EOE M/F/D/V.

Tech Data

JOBS!

DICE is looking for Data Processing, Engineering and Technical Writing professionals to fill open positions for companies nationwide.
DICE is a FREE online job search service, providing detailed information about current contract and fulltime positions across the USA. Please contact by calling ANY of these access numbers, using your computer & 1200-9600 baud Modem, 8-N-1.

California	408-737-9339
Georgia	404-523-1341
Illinois	708-782-0960
Iowa	515-280-3423
Massachusetts	617-266-1080
New Jersey	201-242-4166
Texas	214-691-3420
Internet	telnet dice.com
Web	www.dice.com

DATA PROCESSING INDEPENDENT CONSULTANTS EXCHANGE

A Service of Dial Online, Inc. (313) 280-1144

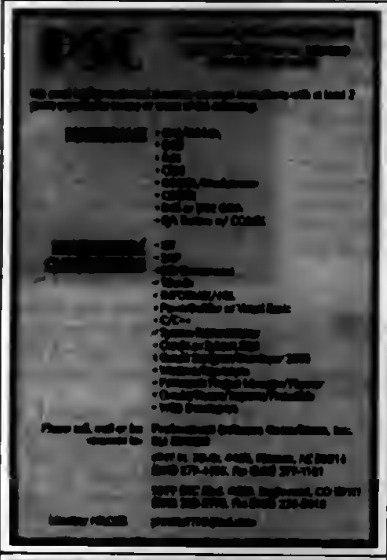


Click here!

CCCI has several clients who are implementing Client/Server and utilizing Object Oriented Languages. Experience in manufacturing, utility, health care, telecommunications, or financial industries would be helpful. We are looking for individuals that have demonstrated skills and can work in a team environment. Positions include Project Leaders, Systems Analysts, and Programmer/Analysts. Some of the skills we are seeking include VISUAL C++, VISUAL FOX-PRO, VISUAL BASIC, POWERBUILDER and DELPHI. If you are familiar with Client/Server or OOP Languages and are interested in challenging opportunities, please call or fax/mail your resume.

Computer Career Consultants

Suite 1830 Meidinger Tower, Louisville, KY 40202
(502) 589-4100 Fax (502) 589-3107



Director of Oil and Gas Sector needed for computer consulting firm located in Houston Texas. Job duties include: Development of service offering for the management and operation of retail gas stations worldwide. Integration, implementation, and management of large software packages and participation in international projects for oil and gas companies. Evaluate staff performance. Responsible for billable services performance, engagement management, sales, reporting, and business unit support. Applicant must have a B.S. degree in Economics or Business Administration. A foreign degree is acceptable if determined to be equivalent by a recognized authority. In addition, the applicant must have 5 yrs. exp. in the job offered or 5 yrs. exp. as a business manager which includes management and implementation of large scale software projects in the oil and gas industry to include packages for retail automation, financial and accounting, marketing, and security systems, business management of gas station, convenience store networks to include international development and industry trends. Must be willing to travel both nationally and internationally approx. 1/3 of the yr. 8:00 am - 5:00 pm, 40 hrs/wk. Mon-Fri, $80,000/yr. Apply at the Texas Employment Commission, Houston, TX or send resume to the Texas Employment Commission, 1117 Trinity, Rm. 424T, Austin, TX 78701 JO #TX7855010. AD PAID BY AN EQUAL OPPORTUNITY EMPLOYER.

Software Engineer (Legacy Systems-VAX computers): Structured systems analysis, design & develpm't, testing, implementation & integration of complex on-line transaction processing distributed, client/server & other MIS application systems in a multi-hardware/multi-software environ. Install'g VAX cluster & VAX workstations using file systems, relational/network database mgmt systems, Third Generation Language (3GLs), Fourth Generation Languages (4GLs), forms packages & GUI front end tools. Design & develpm't of mission critical client-server systems & migration of legacy systems to client-server architecture. Req: B.S. sci./comp. sci./engr'g (or equiv.) & 2 yrs exp to job offered or as programmer/systems analyst. Must have appropriate combination of plans as follows: 1 of A & 3 of B or 2 of A & 2 of B as follows: A) DBMS: Rdb, Oracle, Sybase; B) tools/languages: DECforms, DECdesign, CDD+, ACMS, C, DECwindows, Powerbuilder, Powerhouse, X-Windows/ Motif, Digital Unix, RMS. High mobility preferred (multiple positions). 40 hrs/wk; $49,000-$60,000/yr. Report/submit resume to PA Job Ctr at: Mr. James Mantis, Mgr., Office of Employment Security, 120 Morehead St., Ambridge, PA 15003. JO #0005491.

SENIOR COMPUTER POSITIONS IN SAUDI ARABIA

COBOL II, MVS, IMS, DB2, VSAM, CICS, PLI
TELON, ENDEVOR, PANVALET
DUN & BRADSTREET, MILLENNIUM
MICROFOCUS, XDB
INFORMATION SYSTEMS PLANNING
BUSINESS ANALYSIS
UPPER CASE METHODOLOGY

Excellent Tax Free Salaries, Housing, Medical & Transport

THESE ARE IMMEDIATE OPENINGS SO FAX YOUR RESUME TODAY TO:

ARABIAN DATA SYSTEMS
P.O. Box 20516
Thuqbah, Al-Khobar 31951
Saudi Arabia
Fax No. (00966) 3-8892960

Software Engineer (SE6): structured systems analysis, design, development, testing, quality assurance, implementation, integration, maintenance, support & conversion of large volume online transaction processing & batch application systems in a multi-hardware/multi-software environment over centralized database systems using relational/hierarchical/network database management systems, Third Generation Languages (3GLs), Fourth Generation Languages (4GLs), CASE tools & Transaction Processing Software. Requirements: B.S. in Computer Science, Engineering or Science (or equiv.) & 2 yrs exp to job offered or as Programmer/ Analyst/Systems Analyst. Must have appropriate combination of skills as follows: 1 of A & 1 of B & 1 of C; or 1 of A & 3 of B; or 1 of A & 2 of C. A includes DB2/2, DB2, IMS DB, IDMS/DB, B includes Tools: CICS, IMS DC, IDMS DC, ADS/O, QMF, VSAM, ISF-Workbench; C includes Languages/CASE tools: TELON, ISF, ADW, CSP, APS. High mobility preferred. (Multiple positions) 40 hours per week; $48,000 - $60,000 per year; Report/Submit resume to PA Job Center, Ms. Joan Lang, Mgr., Office of Employment Security, 300 Sheraton Drive, Pittsburgh, PA 15086. JO #0005402.

West Coast Openings

- CICS Systems Programmer
- MVS Systems Programmer
- VTAM, TCP/IP Systems Prog.
- Data Security Manager
- DB2 DBA Manager
- Capacity Planner
- DB2 Database Administrator
- MVS Developer 370 ALC
- UNIX Systems Administrator
- UNIX Systems Architect

QUANTUM SEARCH
P.O. Box 189279
Sacramento, CA 95818
Fax: 916-454-9350
http://www.quantumsearch.com

Systems Analyst - 60% of time at client sites in Tampa, FL, 40% of time at various client sites nationwide. Design, prototype, develop & test software in a distributed client/server environment. Utilize Oracle database, TCP/IP, RPC network protocols, AIX, Tuxedo & TopEnd software. Bachelors/Comp. Sci, Engg or Math, 2yrs/exp in job offered or 2yrs or Engrg &/or Prog. Exp in job offered or related occ. must and, 2yrs using Oracle database, TCP/IP, RPC network protocols, AIX & 1 yr/exp using Tuxedo & TopEnd software in a distributed client/server environment. 40hrs/wk (8-5, M-F) $48,000/yr. Send resume to Job Service of Florida, 2312 Gulf-To-Bay Blvd., P.O. Box C, Clearwater, FL 34618-4080. Re: Job order number FL-1438450.



We appreciate Computerworld's recognition of our commitment to a professionally encouraging work environment. And since we have 50+ locations in North America, it's 50 times as good. So no matter where you live, there's bound to be a great place to work in IT.

Opportunities are currently available in:
• CHICAGO, IL • CINCINNATI, OH • CLEVELAND, OH • COLUMBUS, OH • DETROIT, MI • FT. WAYNE, IN • GRAND RAPIDS, MI • INDIANAPOLIS, IN • MERRILLVILLE, IN • MILWAUKEE, WI
for technical professionals skilled in one or more of the following:

- IMS DB/DC
- COBOL, CICS, DB2
- ORACLE DBA
- UNIX, VMS
- POWERBUILDER
- IDMS, ADSO
- MVS SYSTEMS PROGRAMMER
- PROJECT MANAGER - w/IMS
- ORACLE FORMS 4.0
- SAS MACROS
- DELPHI
- ADABAS NATURAL
- LOTUS NOTES DEVELOPER

The best place to work offer the most options. At CTG, we can offer hourly or salaried opportunities, depending on your needs. Compensation is excellent, and benefits include a 401(k) from your very first day. For immediate consideration, forward your resume to:

CTG-Midwest Sourcing Center
8001 Broadway, Ste. 201
Merrillville, IN 46410-5538
Ph: (800)214-2830
Fax: (800)249-6186

For information regarding opportunities throughout North America, please call: 1-800-375-2094. You will be connected to the sourcing center in your area.

www.ctg.com

ctg

Winds of Opportunity

Job offers aplenty blow through the Windy City

By William Spain

It is called, among other names, "The City That Works." And with an economy as diversified as the many ethnic groups that call it home, Chicago offers opportunities to skilled information systems professionals in several industries.

From food processing to transportation and financial services to telecommunications, the skills in demand are as varied as the companies that need them. Although virtually all Internet-related skills are in high demand, some of the area's biggest employers continue to rely on mainframe technology.

At United Airlines, "We continue to look for traditional systems personnel — C programmers and Fortran — to work on our large centralized system," says Andy Studdert, senior vice president and chief information officer at UAL Corp. in suburban Elk Grove Village.

"In the last year, we have focused, to a great degree, on our existing mainframe," Studdert says. "We are still continuing to hire mainframe, [database] and [graphical user interface programmers]. Database people are really hot."

But finding the right skill sets "is becoming more of a challenge," Studdert says. "We are having some shortages, but right now, we are generally able to fill the slots with quality people."

Lack of candidates

At catalog retailer Spiegel in Downer's Grove, "We are basically a Cobol, CICS and DB2 shop," says director of systems and programming Richard Steinke. "We are getting into client/server and EDI, [but] finding qualified people in these areas is difficult."

Spiegel's IS staff "needs to have both PC and mainframe skills. We use a lot of programmer/analysts. Our people have to do both the analytical side and the programming," Steinke says.

William Link, director of admissions at the Computer Learning Center in Chicago, watches the local IS job market. He says, "What is hot right now is networking and connectivity skills of all kinds. Novell certification — as engineers, instructors and administrators — is in demand. There is still a demand for AS/400 and Cobol; we have no problem placing our students" in those fields.

Some industries must go begging for talent, Link says. These include "banking. Even though they are downsizing in other areas, they are hiring a lot. Insurance companies need a ton of programmers." Also included on Link's hiring hot list are aerotech, telecommunications, government, legal, financial services and consulting firms.

At advertising agency Leo Burnett, "The No. 1 thing is visionary skills," says CIO Rick Capp. "We need high-level entrepreneurial developers who can break out of that typical [information technology] department box. We also need planners, people who understand the ad business and can strategize and plan the systems of tomorrow."

More specifically, Capp says, Burnett "is always looking for good, qualified programmers, C++, PowerBuilder and good quality Notes developers. ... It seems as though everyone is facing the same business re-engineering obstacles; everyone is trying to migrate to a client/server architecture."

Ken Bergren, managing partner at Andersen Consulting, a management and technology consultancy with a large operation in Chicago, says, "In general, anything related to Unix technology — Oracle, Sybase — are skills that are in very high demand. There is also a growing interest in object-oriented skills. SAP software skills are also highly prized."

Traditional skills not popular

Less in demand, Bergren says, are some of the traditional mainframe skills such as Cobol, DB2 and CICS. "What you will see is that there are a lot of old mainframe applications, but companies are doing maintenance only. And it is rare to see any significant levels of new development," he says.

Internet and intranet, however, "are coming up very rapidly. Java came out of nowhere, and all of a sudden, those types of skills are in very high demand," Bergren says.

And if the job opportunities aren't enough to lure IS people from other regions and keep homegrown ones around, employers also stress quality-of-life issues. While Chicago has virtually all the pleasant attributes of urban life — restaurants, culture, ethnic diversity — found in a New York or Los Angeles, the cost of living is generally far less.

With more than adequate housing stock, it has long been a buyer and/or renter's market. While the winters are legendary for their duration and ferocity — though the "Windy City" sobriquet actually refers to the area's blustery politics — Chicago comes alive during the summer months with a multitude of music, heritage and neighborhood festivals. There are also two baseball teams, one of which is apt to be playing at home almost every day of the season.

Public transportation is adequate, and getting in and out of town is quick and easy. Chicago is the air transportation hub of the nation, with daily direct flights from one of two airports to every major city in the U.S. and many foreign destinations.

"This is the best city in the country," Capp says. "It's a great business town, a good working environment and full of great opportunities." ■

Spain is a freelance writer in Chicago.

What the jobs pay

IS professionals in the Chicago area have seen the following earnings:

Job title	1995 salary	1994 salary	% change
Senior systems analyst	$51,891	$48,500	+7.2
Systems analyst	$40,000	$40,000	–0.0
Manager of information systems	$55,400	$53,700	+3.1
Supervisor of computer operations	$42,000	$40,300	+4.4
Senior programmer/analyst	$46,000	$44,300	+3.5
Programmer/analyst	$39,200	$38,400	+2.0
Programmer	$33,000	$32,000	+3.1
Senior computer operator	$28,700	$25,700	+11.1
Computer operator	$24,100	$22,500	+7.2

Source: Andrews Hinds Business Association/Crain's Chicago Business

The high and mighty

The largest employers in Chicago include the following:

Employer	Number of employees
1. U.S. Government	73,506
2. Chicago Public Schools	43,005
3. City of Chicago	40,312
4. Cook County Government	27,940
5. Sears, Roebuck and Co.	26,073
6. Jewel Food Stores	24,306
7. Motorola, Inc.	23,000
8. State of Illinois	22,563
9. Ameritech Corp.	18,356
10. Dominick's Finer Foods, Inc.	18,000

Source: June 1995 figures, Crain's Chicago Business



PROGRAMMERS/ SR. PROGRAMMER ANALYSTS

Outstanding leadership, experience and talent have made Bankers Life and Casualty the insurance leader it is today. Now, you can become a part of our success by bringing your technical knowledge and skills to Bankers.

We're currently seeking Programmers with a minimum of 3 years COBOL experience for data processing opportunities. The essential functions of one opportunity also require programming experience in an IBM 3090X OS/MVS environment with knowledge of TSO/ISPF, JCL and Panvalet. These opportunities require a solid educational background in programming and/or equivalent work experience. Strong analytical and communication skills along with the willingness and ability to work "on-call" are also required.

A Bachelor's degree is preferred along with VSAM, CICS and PC experience. If you meet our requirements and are looking for a new opportunity, send your resume with salary history today to:

Kathi Slomka
Employment & Recruiting

BANKERS
LIFE AND CASUALTY COMPANY
222 Merchandise Mart Plaza
Chicago, IL 60654-2001
FAX: 312-396-5970

We Support A Drug Free Workplace
Equal Opportunity Employer M/F/D

JOIN THE SUCCESS OF A $20 BILLION INTERNATIONAL LEADER!

Aon, a $20 billion international insurance and financial services leader headquartered in Chicago, is seeking several qualified Application Developers to fill a variety of Programmer/Analyst and Senior Programmer/Analyst positions.

Successful candidates will have 3+ years experience in a variety of skills, including:

- COBOL, BAL, VSAM, TSO/ISPF, and application development tools in a mainframe environment
- IDMS/R, IDMS, preferably, CICS and ADS/O
- AS/400 platform experience, including RPG, RPG400, DB2/400, CL, AS/400 operations and utilities
- Communication and analysis expertise
- Proficiency in technical leadership, creative problem solving and systems design
- Interests and/or completing experience a definite plus

Our compensation and benefits package is highly competitive and we encourage continued growth. Send resume and salary history to: AON SUBSIDIARIES, Human Resources, Attn: Technical Recruiter-CW, 5050 N. Broadway, Chicago, IL 60640. Fax: (312) 769-8705. EOE. Principals only, please. For additional information, visit our website at: http://www.aon.com

AON®



You'll be amazed by the environment at ISSC, a subsidiary of industry leader IBM. As one of Chicago's newest and most dynamic I/T service organizations, we provide a full range of I/T services for one of America's largest financial institutions. As we continue to advance today's most challenging technology, we can offer technical professionals the chance for career building in most areas of hardware and software development. We are conveniently located at the western edge of the downtown Chicago Loop, just minutes from most transportation stations and expressways. For opportunities that give your work worldwide impact, consider these immediate openings:

Applications Programmers/Analysts

You'll be involved in all aspects of development and small enhancements. Additional responsibilities include working independently as an application lead, providing support in test and production environments, and trouble-shooting.

- Applications programming experience
- Strong analysis and trouble-shooting skills
- Background in COBOL, DB2, CICS, MVS and VSAM

Applications Project Leads

In this position, you'll lead the analysis, design, coding and implementation of applications enhancements and developments.

- 5+ years experience in IS
- Customer/client contact background
- Experience in analysis, trouble-shooting and team leadership
- Background in COBOL, MVS, CICS, DB2 and VSAM

Object-Oriented Developers [Smalltalk]

We'll rely on you to develop and review object models, guide OO design, mentor on OO development techniques and Enfin/Smalltalk coding, and provide I/T solutions in our corporate banking area.

- Superior Windows and Smalltalk knowledge
- Experience in object-oriented development
- Background in Database, Operating Systems, DB2, OS/2, and C

Project Manager-Lotus Notes/cc:Mail

You'll identify resources, develop plans, and oversee the implementation of the Lotus Notes infrastructure, a system integrated with cc:Mail, for our 3500+ users.

- Excellent client contact skills and project leadership ability
- Very good knowledge of Lotus Notes and cc:Mail

In addition to an excellent compensation and benefits package, we offer an entrepreneurial working environment that will allow you to reach your professional goals. For consideration, please send your resume, indicating position of interest and Job Ref. #IBMRAZ367 on resume and all correspondence, to: IBM Staffing Services, P.O. Box 12464, Raleigh, NC 27619-8404; FAX: 1-800-282-2494; e-mail: jobs@vnet.ibm.com. Visit our website at http://www.empl.ibm.com/issc.htm for additional information on our current openings. ISSC is committed to creating a diverse environment and proud to be an equal opportunity employer.

IBM

LAUNCH YOUR CAREER WITH A LEADER!

Join PLATINUM technology, inc., a leading provider of software solutions for managing the open enterprise environment. PLATINUM is in the middle of a major growth phase and has grown by over 2,000 employees in the last two years! We are continuing our efforts for expansion and are currently seeking the following professionals in the Minneapolis area.

Product Managers

Your primary duties will encompass being the product expert on a significant feature set within the On-Line Analytical Processing (OLAP) product set that we are developing. You will be consulted as the expert in the organization regarding competitive products and offerings and how our product compares to those offerings. Additionally, you will operate within the Product Management function, will have significant interaction with the personnel in Development, Sales and Senior Management as well as manage the product plan and be accountable for the content of product releases. Information exchange to the field force, including internal Sales and Technical personnel, as well as third parties, will be your responsibility. Ideal candidates will possess an educational background that includes at least an undergraduate degree, with an advantage given to those who have attained a Master's degree. Professional credentials should include experience in a market-leading software firm in roles that could range from field implementation, product management, sales and marketing. 3-7 years of experience a must. Personal attributes must include self motivation, critical thinking, solution orientation and the ability to work within a team framework.

Assistant Product Manager

Your primary duties will encompass being the product expert on a feature set within the On-Line Analytical Processing (OLAP) product set that we are developing. You will work closely with development personnel in ensuring that all phases of the product development lifecycle are executed on a timely basis. Operating within the Product Management function, you will have significant interaction with the personnel in Development and complementary technology firms and will manage a portion of the product plan. Formulation of vehicles to facilitate information exchange to the field force, including internal Sales and Technical personnel, as well as third parties will be your responsibility. You will also formulate prototype feature functionality and build demonstration scenarios as well as work with user education to provide learning tools. Ideal candidates will possess an undergraduate degree with professional credentials including experience in a market-leading software firm in roles that could range from field implementation, product management, sales and marketing. The years of experience should range from of least 2-5. Self motivation, critical thinking, solution orientation and the ability to work within a team framework essential.

Technical Writers

Your primary duties will encompass developing user manuals, on-line help, examples, demonstration scenarios, tutorials and training courseware for internal and external audiences, our On-Line Analytical Processing (OLAP) products and for complementary integrated products. You will work with product management, development, sales and partner firms to understand the user education requirements of each. It will be your responsibility to develop deliverables that instruct on product operation as well as prescribed methodologies. Ideal candidates will possess an undergraduate degree, with special consideration for those who have attained a Master's degree. 3-5 years of experience with a market-leading software firm in documentation, training, development or user education are highly desirable. Personal attributes must include self motivation, critical thinking, solution orientation and the ability to work within a team framework.

We will reward your talents with an excellent benefits package including medical/dental/life insurance as well as matching 401(k), tuition reimbursement and flexible hours, all in a casual dress atmosphere. Send your resume, indicating position of interest and salary requirements, to: PLATINUM technology, inc., Attn: Hiring Manager, 11085 Viking Drive, Suite 225, Eden Prairie, MN 55344, Fax: (612) 942-1010. e-mail: staffing-midwest@platinum.com

For more details about PLATINUM, visit our WWW site at http://www.eiuser.com

PLATINUM TECHNOLOGY

aa/eoe m/f/d/v

http://careers.computerworld.com



SOFTWARE ENGINEERS

Northrop Grumman is recognized for its leadership and achievement in the design and development of real-time, embedded software and is a major midwest manufacturer of advanced electronics systems. We are an SEI level 3 organization committed to further development in software process and technology.

Applications include active RF and IR systems. Positions at various levels from individual contributor to project leaders. BS Physics/EE/CS/Math and a minimum of 3 years "C" programming, software development for real-time multitasking/multi-processor, embedded systems experience required. Electronics warfare industry experience a plus.

ADA & C Software Developers

Experience in design, implementation, test, integration of real-time embedded and non-embedded software. ADA or C language required. Knowledge of modern software design methodologies necessary.

Software Architects

To initiate design projects and perform requirements analyses, algorithm development and high level design. Requires an advanced technical degree and a minimum of 5 years experience in the development of large-scale real time embedded software systems. Knowledge of computer hardware architectures, performance simulation, modeling and exposure to knowledge based expert systems and object-oriented programming techniques, a plus.

Embedded Software Developer

Detailed design, coding, testing and integration of embedded real-time software implementation experience using modern software design methodologies.

Communications Software Engineers

Our marketing thrust into the wireless communications business has resulted in a need for software design professionals with minimum of 3-4 years C/C++ language experience and desire to create state-of-the-art software applications for sophisticated wireless communications products.

For detailed additional openings, view us through the net: http://www.cweb.com/resources/northropgrum/ or send resumes as ASCII text to: resumes@dsd.northrop.com or fax (847) 580-3189 or mail resume to: Manager- Staffing, Northrop Grumman EIWS Dept MM/T20, 600 Hicks Road, Rolling Meadows, IL 60008

We offer a competitive salary/benefits package including: Health/major medical/dental/life insurance, 401(k) and pension plans. Excellent relocation package. We are a smoke-free workplace. U.S. citizenship required for most positions. An equal opportunity employer m/f/d/v.

NORTHROP GRUMMAN

Start your day...

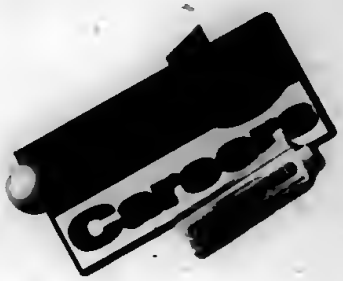
@

COMPUTERWORLD

The Internet Connection for the IT Community

www.computerworld.com

http://careers.computerworld.com



Opportunities
With An Industry

Creativity & Quality. They brought us to where we are today...and will take us to where we want to go tomorrow. We are Interim Technology (formerly Computer Power Group), a $250 million provider of consulting services to the information technology industry. We have achieved phenomenal success through developing and delivering unique service offerings that meet our clients' IT needs. We are growing at double the industry growth rate AND creating leadership positions throughout the United States.

Branch Directors. Your demonstrated success in the IT consulting industry is required to lead new branch offices. Your accomplishments should include business development and successful financial management. Experience in solution selling is essential.

Practice Directors. Our service offerings are delivered through various practices within the organization and include Client/Server, Legacy, Network Integration, Software Quality Management, Telecommunications, Year 2000, Technical Communications, and Management Consulting. Your IT consulting background in a related area, along with expertise in P&L management, sales support, client presentations, and staff management will qualify you for consideration.

Account Executives. Your experience with Fortune 500 clientele in the presentation and sale of IT consulting services is required. You will be relied upon to build and maintain multiple accounts within a specific geographic territory. You must be a team player with demonstrated relationship-building skills, particularly with senior management.

Staffing Specialists. We are seeking independent self-starters who understand the difference between contracting and full-time consulting. You will be presenting our permanent career opportunities to IT professionals, and must have the technical recruiting experience to source, recruit, and close high-caliber professionals who meet our standards of excellence. You should be an energetic team player with strong networking skills. Internet competency a plus.

Inquire about our career opportunities at Branch Offices in the following regions:

West Southwest Midwest Atlantic Southeast

Interim Technology provides an excellent salary, comprehensive benefits, 401(k), and tremendous possibilities for advancement. Please direct responses to: Sheila Wilfinger, Interim Technology, 823 Commerce Drive, Oak Brook, IL 60521. FAX: 708/574-3076. EOE. Visit us on-line at: www.interim.com.

Interim®
TECHNOLOGY
the consulting group

FORMERLY COMPUTER POWER GROUP

RANKED 7th BEST PLACE TO WORK!

DALLAS • HOUSTON • ST. LOUIS • CHICAGO



You make the shot. You be the star!

At Price Waterhouse we reward achievement. In the business world the person who accepts the challenge and produces winning results should be rewarded. If you are an achiever, our merit-driven career structure will allow you to thrive!

Price Waterhouse LLP

We were delighted, but not surprised, to be the only consulting firm ranked in the "top 10" of Computerworld's 1996 list of the 100 Best Places to Work. At Price Waterhouse, we provide our professionals with:

- Access to the hardware and software they need to stay on the cutting edge of technology.
- "Virtual Officing" which mobile professionals must have to stay in touch.
- A world-class career model with industry leading coaching, compensation and benefits.

If you're a seasoned professional with 4-20 years of industry, consulting, or technically related expertise, let's talk!

Currently we're seeking those with specific SAP, Oracle Financials, PeopleSoft, Prism, BAAN or similar package experience. Industry projects vary and the opportunity to develop a portfolio of expertise is very real and even encouraged.

At Price Waterhouse we will empower you with a different type of corporate culture, one that allows you more project control coupled with a merit- driven environment.

Are you interested? Contact via mail or fax or visit our site on the WWW. Price Waterhouse LLP, LOC1845, 2001 Ross Ave., #1800, Dallas, TX 75201-2997. Fax: 214-754-8517. http://www.pw.com

Best Places to Work 96

Equal Opportunity Employer M/F/D/V

---

http://careers.computerworld.com



9thi

Recruit top I.T. students from top I.T. Campuses!

Plan Now!
1-800-343-6474, x5101

Issue Date: October 21, 1996
Close: September 16, 1996



http://careers.computerworld.com

TOUCH THE FUTURE TODAY!

When you think of Allstate, envision a state-of-the-art information technology provider. At Allstate, we understand that our future is enabled by technology, and we intend to maintain our position on the leading edge. Allstate will provide you with:

- The latest technology
- The opportunity for professional advancement
- The challenge of change housed in the continuity of a stable corporate environment
- A very generous compensation and benefit package

There is only one way for you to touch the future today – by joining the Allstate Information Technology team! Allstate operates in ORACLE 7.0 and DB/2 environments. We currently have openings from entry to senior-level positions at our four locations: Northbrook, South Barrington, Arlington Heights, and Mundelein. We are aggressively recruiting for the following positions, all of which require a bachelor's degree in computer science or a related field.

APPLICATION DEVELOPMENT
Requires experience with Windows-based, client/server development using RDBMS, GUI development tools, PowerBuilder, C, C++ and Microsoft Office toolkit. Positions are also available for candidates with COBOL experience in a mainframe environment.

DATA ADMINISTRATION
Experience with Information Engineering methodology and/or CASE tools a must. RDBMS experience with ORACLE or DB/2 required. Requires logical data modeling skills, relational data management, and decision support systems experience.

DATA WAREHOUSE DESIGN
Requires experience with relational database design, relational theory, BOL, data modeling techniques, CASE tools, and decision support skills.

OBJECT-ORIENTED PROFESSIONALS
Requires experience in object technology including methodology, analysis and design, Smalltalk application development, GUI design, class library design and distributed systems.

TELECOMMUNICATIONS PROFESSIONALS
Minimum of 5 years experience in a network environment using Token Ring and/or Ethernet topology. Experience with analysis, design, implementation of large scale networks including: IPX/SPX, SNA, TCP/IP, Novell Network, and Windows NT Server, etc.

PERFORMANCE MANAGEMENT
Manage performance, tune and plan for a CICS, COBOL application online/batch cycle; knowledge of SAS, Strobe performance analysis tools; MVS, VSAM, JCL, COBOL/COBOL II, CICS.

TECHNICAL SUPPORT SOFTWARE PROGRAMMERS
Responsible for OEM vendor product installation and CICS support functions. Responsible for migration, configuration, maintenance and support in an MVS 5.1 Sysplex environment utilizing CICS 4.1 PTS architecture. Knowledge of SPF and JCL is required. Minimum of 3 years experience is desirable.

Allstate offers an exceptional compensation package consisting of life, medical, dental and vision insurance plans, a company-paid pension plan, 401(k) profit sharing plan, and Work/Family Benefits including child/elder care, adoption, and education planning and assistance, employee assistance program, flexible spending accounts, legal care plan, long-term care and tuition reimbursement.

If you're a person who thrives on change and is stimulated and motivated by the first-time challenges that occur in a growth environment, then...being in good hands is the only place to be.SM Touch your future today – e-mail your resume to: itjobs@allstate.com; or mail/fax to: Allstate Insurance Company, Information Technology Selection Team, 2775 Sanders Road, Suite A-1, Northbrook, IL 60062. FAX: (847) 402-0008.

Allstate is an equal opportunity employer and we encourage men, women, the disabled and veterans to apply.

Allstate

Plug into cable tv.

We're Ameritech New Media—redefining the way we think, learn and interact through interactive products. Now as we usher in a new era of cable TV, we're looking for the following professionals to join us at our Chicagoland locations:

Engineering Systems Manager (AM/FM) - Act as the lead member of team responsible for systems administration and applications support for an AM/FM GIS System in a growing environment. Requires a customer focused professional with experience in GIS, AM/FM and vendor/project management. Knowledge of UNIX, Oracle, and CATV engineering and construction also desired.

Construction Systems Information Analyst - Part of a team responsible for a suite of applications for CATV construction forces. Duties include developing and maintaining inventory management applications, and acting as liaison between engineering, project management and other down stream systems. Requires a background in UNIX development and administration (Solaris and/or SCO), C and C++ development, Oracle and SQL development, Windows 3.1 and/or 95 and Novell. PowerBuilder skills and CATV engineering and construction knowledge are a plus.

Sr. Systems Engineers (Distributed or UNIX Systems) - Senior engineering and support positions available responsible for desktop operating systems and related network services or UNIX systems in a growing client/server environment. Duties include engineering new systems, communications software, and middleware, integrating systems and managing the deployment and roll-out of new systems and software releases. Positions require systems level experience in one or more of the following: Windows 3.11, Windows 95 and NT (certified Microsoft engineer preferred); Novell (certification preferred) and/or UNIX, TCP/IP, and WAN/LAN.

Information Analyst (Subscriber Management Systems) - Member of systems support staff responsible for the subscriber management system and fleet management/dispatch systems. Responsibilities include systems availability, database integrity, functional continuity and table changes. Requires experience in requirements gathering and correlation as well as application administration.

Systems Administrator - Responsible for day-to-day administration of cable network and operation support computer systems. Requires ability to travel and work flexible schedule including off-hours system work and on-call status. Requires experience in UNIX, DOS, Windows, shell programming, distributed systems management and client/server application support.

Integration Test Specialist - Create/implement test plans and procedures to verify functional operation of architecture. Requires 3-5+ years of systems testing/integration experience in one of the following disciplines: computer networks; RF communications, video/audio signal processing and computer applications.

Ameritech NEW MEDIA

For more information, send or FAX resume with salary history (indicating position of interest) to: Human Resources, Dept. CW, Ameritech New Media, 300 S. Riverside Plaza, Chicago, IL 60606. FAX: 1-888-216-8337. EOE

http://careers.computerworld.com



Computerworld's 1995-96 Salary Survey is Now Available on Disk!



What are other IS managers paying their staff?

Are you offering competitive rates?

Which industries are paying top dollar?

Answer these questions and more with Computerworld's 9th Annual Salary Survey on disk, where compensation for 28 information systems positions is covered in 23 industries.

Plus!
The Disk also includes Computerworld's first survey ever on hot skills. Find out the premiums IS managers are willing to pay for specific IS skills. Which skills are in the highest demand? Which industries are willing to pay top dollar for them? You'll find over 60 technology skills listed which include development tools, languages, operating systems, networking and internetworking equipment, RDBMSs and more. All are broken out in 14 industries and in 12 metropolitan areas.

All this for just $299.

Call today! 1-800-495-0157

Computer Info. Systems

CBOE

A commitment to the Best!!

NEW DEVELOPMENT PROFESSIONALS

Since our inception in 1973, the CBOE has revolutionized Options Trading. We continue to set new industry standards, utilizing new technologies, new ideas and of course talented professionals. Thinking about a career change? Think about the CBOE.

DISTRIBUTED SOFTWARE AND PC DEVELOPMENT
Minimum 5 years UNIX or MS-DOS, C, TCP/IP (MS-WINDOWS, LU6.2 or C++ a plus) and development experience in high availability design. Network communications programming required in some positions.

MVS DEVELOPMENT
Minimum 5 years experience in MVS, COBOL/ COBOL II, CICS, SQL, VSAM, and relational database (LU 6.2 or TCP/IP a plus). Must possess excellent design, analysis and programming skills, have development experience in all phases of the project lifecycle and be willing to be a lead technician with a hands-on technical role.

QUALITY ASSURANCE ANALYST
Minimum 3 years experience in client server source configuration management, PVCS Version Manager (Configuration Builder is a plus). A working knowledge of the Unix Operating System, Unix security administration, a familiarity with the use of ftp, rcp, telnet, and hands on experience in the creation, modification, and maintenance of shell scripts are required.

Compensation and benefits are very attractive. Send resume with salary history stating position desired in confidence to: **The Chicago Board Options Exchange, Dept. NDP, 400 S. LaSalle St., Chicago, IL 60605 or Fax 312/786-7469. Visit our home page to find out more about the CBOE: http://www.cboe.com**

The ChicagoBoard Options Exchange

CAREER opportunities

...are awaiting you at Blue Cross and Blue Shield of South Carolina.

Due to rapid growth, we are currently accepting resumes/ applications for several positions presently vacant. Several Programmer/Programmer Analysts, and Systems Analysts, all positions are located at our Columbia, SC office.

Information Systems Network Engineer: Work experience required is at least 7 + years in one or more of the following: OS/2, TCP/IP, UNIX, Windows 95, Windows NT, Client Server programming, SNA, and Internet Facilities. Experience with CISCO Routers, or and as network management on a Token Ring environment and as in depth knowledge of PC's is required. PC programming a major plus.

Programmer Analyst: Successful candidate must have the following skills: mainframe customized II, GUI, and also the following Client Server technology: knowledge of and/or experience with client soft / client builder, screen scraper, and PC oriented. Must know and understand the mainframe. Knowledge of IMS or DB2 preferred. Other programming languages a plus.

Programmer Analyst: Successful candidate must have solid customized II, JCL, and ITB experience.

Systems Analyst: Must have to least four years experience in programming or systems analysis. Must include a minimum of two years programming experience in customized II in an OS/MVS environment. IMS or DB2 a plus.

We offer competitive salary, flexible benefits program, smoke free work environment and excellent career development opportunity for qualified professionals. Send or fax resumes to:

HR Recruiting
Blue Cross and Blue Shield of SC
I-20 East at Alpine Road
Columbia, SC 29219-0001
Fax # (803) 699-8000

EEO/M/F/H/V
NO AGENCIES PLEASE

Indiana State University

COMPUTER SUPPORT POSITIONS AVAILABLE IMMEDIATELY:

Under supervision of Associate Director of User Services, Academic Computing and Networking Services (ACNS).

SENIOR SYSTEMS ANALYST:

Perform moderate to complex systems analysis & programming tasks; research, analyze, recommend, implement & maintain database systems & applications to track, report, & improve quality & timeliness of support services primarily provided by User Services consultants & ACNS Help Desk; future development of new ACNS consultant support service to provide systems analysis/computing project support across campus.

FOUR MICROCOMPUTER/ NETWORK CONSULTANTS:

Perform moderate to complex problem resolution, evaluation, testing & implementation of projects re campus software applications, micro or networks; provide training & consulting support on micro software & Internet applications. DOS, Windows, Macintosh systems, perform network administration and student lab management functions; troubleshoot systems in microlabs & offices.

COMPENSATION:

Competitive salaries & excellent fringe benefits.

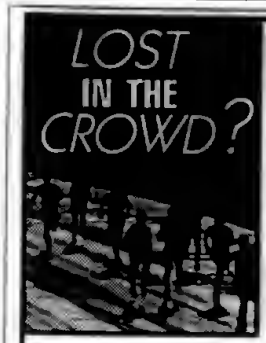
TO APPLY:

Screening begins July 15, 1996. For candidate requirements and application process, call 812-237-8439 for information packet or see http://web.indstate.edu/acns/user-serv/about/

AA/EOE

PROGRAMMER ANALYST (2 openings) - plan, develop, test & document comp programs, applying knowledge of programming techniques & comp systems; evaluate user request for new or modified programs, determine feasibility, cost & time req'd, compatibility with current sys & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives; formulate plan outlining steps req'd to develop program using structured analysis & design; convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp. Duties include overall design of system, development of graphical User Interface, drawing B-Spline curves, generating surface modeler, creating shading utility for 3D objects & using Object Oriented Methodologies. MS Windows SDK, ODBC SDK, Sbrave, LEX, YACC, VAX/VMS, UNIX, C, C++, Visual Basic, Visual C++, Rdb & DECforms. Reqs Bach. in Comp Sci., Systems Analysis, Comp. Information Systems, Computer Engg., Electrical Engg. Electronic Engg., Mathematics or as equiv. in ed. & exp & 2 yrs. exp in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Sys. Analyst, Software Engr., Software Engr (Sr Systems Analyst) or Consultant. Will accept 3 yrs. of college ed plus 3 yrs. exp in the job offered or in a related occup. in lieu of the req'd ed. & exp. Must have some related exp which included analysis, design, development & using each of the following: Object Oriented Methodologies, MS Windows SDK, ODBC SDK, Sbrave, LEX, YACC, VAX/VMS & UNIX. $44,720/yr 40 hrs/wk., 8:30a-5p, M-F. Send resume of 7310 Woodward Ave, Rm 415, Detroit, MI 48202 & include Ref #69096 Employer Paid Ad.

PROGRAMMER ANALYST (2 openings) - plan, develop, test & document comp programs, applying knowledge of programming techniques & comp. systems; evaluate user request for new or modified programs, determine feasibility, cost & time req'd, compatibility with current sys & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives; formulate plan outlining steps req'd to develop program using structured analysis & design; convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp. Design, develop, test, implement, analyze & maintain client's data processing & production systems using Client/Server architecture, Windows API, Crystal Reports, DB2, ODBC, DB-Library, MDI Gateway, Windows Communication Libraries, MS Windows, Windows SDK, C/C++, MS Foundation Classes, MS SQL Server & Visual Basic. Reqs Bach. in Comp. Sci., Systems Analysis, Comp. Information Systems, Computer Engg., Electrical Engg., Electronic Engg., Mathematics or as equiv. in ed & exp & 1 yr. exp. in job offered or 1 yr related exp as a Programmer Programmer Analyst, Sys Analyst, Software Engr, Consultant or Analyst Programmer. Will accept 3 yrs. bs college ed. plus 3 yrs. exp. in the job offered or in a related occup. or less of the req'd ed. & exp. Must have some related exp. which included design, development, testing, implementation & using each of the following: MS Windows, Windows SDK, C/C++, MS Foundation Classes, MS SQL Server & Visual Basic. $30,000/yr 40 hrs/wk., 8:30a-5p, M-F. Send resume to 7310 Woodward Ave, Rm 415, Detroit, MI 48202 & include Ref #72599.



Be SOMEBODY

At Information Management Resources, Inc. (IMR), our consultants are valued and respected for their unique individual contributions. As an enterprising U.S.-based international software services company, we provide multiple consulting services to a worldwide Fortune 500 customer base in critical areas such as new development, applications management and outsourcing, and migration services (including Year 2000 conversions). Talk with us about the following:

IMMEDIATE U.S.-BASED OPPORTUNITIES!

▪ Technical Project Managers/Leaders ▪ Systems Analysts ▪ Systems Architects ▪ Programmer/Analysts

All opportunities require multi-platform experience in one or more of the following: MAINFRAME: IBM-MF, DB2, IMS-DB/BC, COBOL, COBOL II, CICS, APS, AS/400, COBOL/400 and RPG/400; CLIENT/SERVER/PC TECHNOLOGY: C++, C, UNIX, ORACLE, SYBASE, INFORMIX, Powerbuilder, Windows-NT, Visual Basic, IEF 5.3/5.2, OOD, GUI and SQL.

INTERVIEWS ARE NOW BEING SCHEDULED

To set-up an interview appointment for opportunities in the United States, please fax or e-mail a resume to John B. Nyhan, Vice President of Recruitment, INFORMATION MANAGEMENT RESOURCES, INC., 26750 U.S. Highway 19 North, Suite 500, Clearwater, FL 34621-3442, Fax (813) 791-8152, E-mail to nyhan@imr.usa.com. Principals only need apply. Equal Opportunity Employer.

Information Management Resources

A Leader in A Time Of Change

• Clearwater • Boston • Chicago • Dallas • Los Angeles • Tampa •

PROGRAMMER ANALYST (2 openings) - Plan, develop, test & document comp. programs, applying knowledge of programming techniques & comp. systems; evaluate user request for new or modified programs; determine feasibility, cost & time req'd, compatibility with current sys & comp. capabilities; consult with user to clarify current operating procedures & clarify program objectives; formulate plan outlining steps req'd to develop program using structured analysis & design; convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processible by comp. Duties include analysis, design, development, implementation & maintenance of a sys, including client interaction to gather requirements, project management, database modeling & entity relationship, preparation of test plan & test cases, implementation of s/w quality standards & configuration management. The technical support provided will be for design of client-server application using UNIX, IBM 3090, PC-486 & Pentium, MVS/ESA, TSO, CICS, JCL, AS (Application Sys.), DB2, COBOL, Endevor, PVCS Version Control, SDK, Visual Basic Windows 3.1, Crystal Reports, SQL-Server, ODBC, C++ & MDI Gateway Architecture. Reqs Bach. in Comp. Sci., Systems Analysis, Comp. Information Systems, Comp. Engg., Electrical Engg., Electronic Engg., Mathematics or its equiv. to ed. & exp. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Sys. Analyst, Specialist, Project Manager, Manager (Software), Assistant Manager (Computers), Operations Engr., Sr. Software Engr., Software Engr. or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed. & exp. Must have some related exp. which included sys. analysis & design & using each of the following: UNIX, COBOL, C++, SDK, PVCS Version Control & Visual Basic Windows 3.1. $48,000/yr, 40 hrs/wk., 8:30a-5p, M-F. Send resume to 7310 Woodward Ave., Rm 418, Detroit, MI 48202 & include Ref. #68296. Employer Paid Ad.

Join a team of professionals that.. & problems creatively quality results.

Creativity & Quality. They brought us to where we are today...and will take us to where we want to go tomorrow. We are Interim Technology (formerly Computer Power Group), a leading provider of consultative services in the information technology industry. We have achieved phenomenal success through creating unique service offerings that meet our clients' IT needs by creatively solving their technical problems.

As we take on more and more challenging projects for a growing number of prestigious clients, our commitment to innovation and quality remains the driving force behind all we do. That's why we are looking for ambitious, achievement-oriented professionals who share our standards. We have the following career opportunities available:

Business Analysts with experience in liaison roles, defining requirements, and a background in either Legacy or Client/Server technologies.

Software Developers with minimum 2 years experience in C, C++, Powerbuilder, NT, and Relational Database. Project Management experience a plus.

Programmer Analysts with Project Lead experience preferred. CICS, DB2, PL/1, COBOL, IMS DB/DC.

Sr. Test Analysts and Testers with either Mainframe or Client/Server experience. Knowledge of SQA, MERCURY, or QA Partner tools a plus.

UNIX/NT Systems Engineers. Strong background with large TCP/IP networks; UNIX/NT Administration (HP-UX, Solaris, AIX, SunOS, NT/AS); solid understanding of NFS, NIS, DNS, SMTP, SNA; Web Server and Internet connectivity experience is a plus.

Technical Writers with experience developing software manuals and on-line documentation. Strong communication and analytical skills necessary.

Contact our Staffing Specialists. 708/574-3030, Interim Technology, 823 Commerce Drive, Dpt. CW617, Oak Brook, IL 60521. FAX: 708/574-3076. EOE. Visit us on-line at www.interim.com

Int-rim® TECHNOLOGY

the consulting group

FORMERLY COMPUTER POWER GROUP

Houston's Texas Children's Hospital, the largest pediatric hospital in the country, is currently recruiting for the following position:

DIRECTOR, TECHNOLOGY SUPPORT

This challenging position is responsible for managing Technical Support areas including networks, computer room operations, help desk, workstations, and telecommunications in a multi-vendor, 24-hour a day environment. We seek an individual with a Bachelor's degree (Master's preferred); 10+ years of experience in the computer services industry, including 5+ years in a multi-vendor (hardware and systems software) environment; 5+ years of managerial-level experience with responsibility for budgeting, planning, staffing, and communications; and 3+ years of experience managing large scale host-based systems such as mainframe/minicomputer systems.

Qualified candidates may fax their resumes, including salary history, to: (713) 770-2829 or apply in person at 1919 S. Braeswood or mail resume to: TEXAS CHILDREN'S HOSPITAL, MC#-4232, P. O. Box 300830, Houston, Texas 77230-0630. *Please indicate the title of the position for which you are applying.* We are an equal opportunity employer. Principals only. No phone calls please.

Texas Children's Hospital

INFORMATION SYSTEMS AUDITOR

Huntington Bancshares Incorporated, a $20 billion regional bank holding company headquartered in Columbus, Ohio, has an outstanding career opportunity for an Information Systems Auditor.

The position would be responsible for planning and implementing automated enhancements in the audit process. The desired individual must be able to work independently as well as part of a large group to review new system development and determine if adequate controls are in place and if managerial requirements have been incorporated.

We seek 3-5 years' progressively responsible Information Systems Audit experience in a financial environment. A Certified Information Systems Auditor is preferred. Additional requirements include a Bachelor's Degree in Computer Science or Accounting as well as working knowledge of Hogan systems, Easytrieve, PanAudit, AuditMastenplan, COBOL, LAN/WAN, telecommunications, automated testing tools, relational databases, RACF, UNIX and MVS.

For confidential consideration, please send resume and salary information to: Executive Recruiting, HUNTINGTON BANCSHARES INCORPORATED, Huntington Center, HC0344 Columbus, Ohio 43287.

An Equal Opportunity Employer M/F/H/D

Huntington Banks

Software Engineer - Analyze, design & develop management reporting system with specific thrust on Management Accounting. Design software using ABC Flexcharter 2.0, WORD 2.0, & EXCEL 4.0, on IBM Mainframe 3090, under MVS/XA operating system with extensive use of MVS/JCL. This software used for development are COBOL II, DB2, CICS, FILEAID, FILEAID-DB2, SPUFI, DB2XPERT, & EXTRA! Bachelor's in Management Accounting. Must have 2 yrs. exper as Software Engineer or Programmer Analyst including 1 yr exper in financial system development using COBOL II, DB2 & CICS in IBM Mainframe under MVS/XA operating system, ABC Flexcharter 2.0, WORD 2.0, EXCEL 4.0, FILEAID, FILEAID-DB2, DB2XPERT, SPUFI & MVS-JCL. 40 hrs/wk, 8-4, $60,000/yr. Send resume (no calls) to: Job#10636, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216.

Programmer Analyst - Analyze, design, develop and maintain batch and on-line applications in an IBM mainframe environment with MVS/ESA Operating System. Must have experience with COBOL II, CICS, CSP, DB2 and VSAM. Bachelor's degree in Computer Science or Mechanical Engineering or Electrical Engineering or related occupation (Mathematics or Computer related) required. Must have 2 years experience in job offered or 2 years experience in related occupation as a Programmer or Analyst or Software Engineer with languages above stated. 40 hours per week, ($54,500.00) per annum. Apply at the "Texas Employment Commission", Dallas, Texas or send resume to the "Texas Employment Commission" 1117 Trinity, Room 4247, Austin, Texas 78701. J.O. #TX7503989 "Ad Paid By An Equal Opportunity Employer"

Lotus Notes Administrator responsibilities include working in environment of Lotus Notes 3.3/4.0 base, Lotus V.P. OS/2, Novell LAN Answerys 5.0, PCTCP/IP mainframe of Notes server, level 3 user support & trouble shooting, regarding 3000 user Lotus Notes locations from U.S. to international, design of relational data model using FoxPro, Paradox, MS Access, testing beta version of Notes 4.0 on OS/2 very planning system, working on TCP/IP project to load & configure TCP/IP on Lotus Notes servers. Req. MS in computer sci or industrial eng. 2yr exp in job offered or related or programmer related exp include 1yr in design of relational data model for administration, Lotus Notes network & installation of server and in Novell LAN environment, 1yr in use of FoxPro, Lotus 1-2-3, 40hr/wk, 8-4pm, $28,444/yr. Send resumes to 7310 Woodward Ave. Rm 415, Detroit, MI 48202. Ref No. 71588. Employer paid ad.

Join a team of professionals that...

& *problems creatively*

quality results.

Creativity & Quality. They brought us to where we are today...and will take us to where we want to go tomorrow. We are Interim Technology (formerly Computer Power Group), a leading provider of consultative services in the information technology industry. We have achieved phenomenal success through creating unique service offerings that meet our clients' IT needs by creatively solving their technical problems.

As we take on more and more challenging projects for a growing number of prestigious clients, our commitment to innovation and quality remains the driving force behind all we do. That's why we are looking for ambitious, achievement-oriented professionals who share our standards. We have the following career opportunities available

Business Analysts with experience in liaison roles, defining requirements, and a background in either Legacy or Client /Server technologies.

Software Developers with minimum 2 years experience in C, C++, Powerbuilder, NT, and Relational Database. Project Management experience a plus.

Programmer Analysts with Project Lead experience preferred. CICS, DB2, PL/1, COBOL, IMS DB/DC.

Sr. Test Analysts and Testers with either Mainframe or Client/Server experience. Knowledge of SQA, MERCURY, or QA Partner tools a plus.

UNIX/NT Systems Engineers. Strong background with large TCP/IP networks; UNIX/NT Administration (HP-UX, Solaris, AIX, SunOS, NT/AS); solid understanding of NFS, NIS, DNS, SMTP, SNA; Web Server and Internet connectivity experience is a plus.

Technical Writers with experience developing software manuals and on-line documentation. Strong communication and analytical skills necessary.

Contact our Staffing Specialists. 708/574-3030, Interim Technology, 823 Commerce Drive, Dpt. CW617, Oak Brook, IL 60521. FAX: 708/574-3076. EOE. Visit us on-line at www.interim.com

Int·rim®
TECHNOLOGY
the consulting group
FORMERLY COMPUTER POWER GROUP

SYSTEMS ANALYST to provide on-site consulting for systems analysis, design, development, testing and implementation of software for manufacturing applications on UNIX OS environment using Informix 7.1, Oracle, C, C++, Perl, COBOL and algorithms handling database software with client-server architecture and Informix On-Line DBA. Require: B.S. (or equivalent) in Computer Science and two years experience in the described job duties as Systems Analyst or as Software Engineer. 40% travel required to customer's location within the United States. Salary: $41,274 per year, 8 am to 5 pm, M-F basis. Apply by resume to: Georgia Department of Labor, Job Order # GA 3987716, 1938 Atterson Road, Lawrenceville, GA 30243-6801, or the nearest Department of Labor Field Service Office.

SENIOR PROGRAMMER/ANALYST to provide on site computer consultancy to design, develop, code, debug, test, implement and maintain financial and mainframe applications on a client/server environment using Oracle/Sybase RDBMS, Powerbuilder, object oriented methodology and other tools such as PL/SQL, SQL*Plus, tSQL, class library, Smartstream, and PowerBuilder. Require: B.S. in Computer Science and three years experience in the described job duties. M.S. with one year experience will be acceptable. 40% travel required to customers' locations. Must be certified PowerBuilder developer. Salary: $60,000 per year, 8 am to 5 pm, M-F. Apply by resume to Georgia Department of Labor, Job Order # GA 3987101, 2943 N. Druid Hills Road, Atlanta, GA 30329-3909 or the nearest Department of Labor Field Service Office.

PROGRAMMER ANALYST. Various unanticipated locations in U.S. Enhance & develop applications using POWERHOUSE & HP MPE JCL on HP MPE operating system with IMAGE DB. Use Structured System Methodology to design new applications in client server environment. Develop systems using DELPHI on Windows & UNIX operating system with MS Access & ORACLE Relational Dbs. Create UNIX script files for job control using OCS as scheduler. Implement EIS environment for user reporting & specify requirements for BAP EIS implementation. Requires B.S. in Computer Science or equiv + 2 yr exp in job offered. 40 hr/wk, 8-5, M-F, $48,000/yr. Must have proof of legal auth to work in US. Apply in person or by resume to GA Dept of Labor, J.O. #GA 5988048, 2943 N. Druid Hills Rd, Atlanta, GA 30329-3909 or nearest Dept of Labor Field Service Office.

USER SUPPORT ANALYST SUPERVISOR. Consults with appropriate level clients to determine requirements for new or modified software and hardware running JAD sessions and developing charts and diagrams using IEF or ADW CASE Tools. Supervises subordinates who provide problem-solving support to clients. Responsible for management of client/server project development using IE Methodology. Estimates, plans and coordinates projects, taking into account resources, schedules and budgets. Manages the development of project specifications, the generation of Power Builder/SYBASE code and the writing of system and project documentation to describe the system and its operation to users. Coordinates installation of hardware and software. Must be willing to relocate on a project-by-project basis within the U.S. Required computer applications: OS/2, DOS, Windows, Ampere, Lotus 1-2-3, Multimate, WordPerfect, Microsoft Word, COBOL, PASCAL, True Basic, Assembler, REXX, Natural 2, Natural Construct, Natural Elite, Clipper, Sybase, Novell Netware, ADABAS, ADW systems planning, IEF, Powerbuilder, Sperry Univac, IBM 4381, IBM PC, Apple Mac, Dec Vax, Microsoft Project. Must have three years bs undergraduate study in Computer Data Processing, and 5 years work experience. Hrs: 9a-5p, M-F. $48,000 per yr. Apply to Georgia Dept of Labor, Job Order #GA5979788, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3909 or the nearest Dept of Labor Field Service Office.

Programmer/Analyst (Atlanta). Design, test, code class libraries to provide graphic user interface (GUI) to Internet based applications. Facilitate retrieval from a relational database and conversion to hypertext mark-up for presentation by WWW compatible browser. Design modifications. Convert project specifications into detailed instructions and logical steps for coding. Correct errors. M.A. in Computer Science, Elec. Eng. or equivalent. Proficiency in C, C++. Six months experience with relational DBMS and GUI. $45,000/yr. 40 hrs./wk. Must have proof of legal authority to work in the U.S. Send resume in duplicate to Georgia Dept. of Labor, Job Order # GA 5988563, 2943 N. Druid Hills Rd. Atlanta, GA 30329

PROGRAMMER ANALYST. Various unanticipated locations in U.S. Analyze, design and develop programs using ADABAS, NATURAL, NATURAL 2 and NATURAL CONSTRUCT software on IBM or VAX mainframe. Requires B.S. in Computer Science or equiv + 2 yr exp in job offered. 40 hr/wk, 9-5, M-F, $52,000/yr. Must have proof of legal auth to work in US. Apply in person or by resume to GA Dept of Labor, J.O. #GA 5988042, 2943 N. Druid Hills Rd, Atlanta, GA 30329-3909 or nearest Dept of Labor Field Service Office.

PROGRAMMER ANALYST. Various unanticipated locations in U.S. Design, develop and implement computer systems utilizing INFORMIX 4GL, INFORMIX SE and SQL software on UNIX platform. Requires B.S. in Computer Science or equiv + 2 yr exp in job offered. 40 hr/wk, 9-5, M-F, $40,000/yr. Must have proof of legal auth to work in US. Apply in person or by resume to GA Dept of Labor, J.O. #GA 5985967, 2943 N. Druid Hills Rd, Atlanta, GA 30329-3909 or nearest Dept of Labor Field Service Office.

Indiana State University

COMPUTER SUPPORT POSITIONS AVAILABLE IMMEDIATELY:
Under supervision of Associate Director of User Services, Academic Computing and Networking Services (ACNS)

SENIOR SYSTEMS ANALYST:
Perform moderate to complex systems analysis & programming tasks, research, analyze, recommend, implement & maintain database systems & applications to track, report, & improve quality & timeliness of support services primarily provided by User Services consultants & ACNS Help Desk; future development of new ACNS consultant support service to provide systems analysis/computing project support across campus.

FOUR MICROCOMPUTER/NETWORK CONSULTANTS:
Perform moderate to complex problem resolution, evaluation, testing & implementation of projects re campus software applications, micros or networks; provide training & consulting support re micro software & internet applications, DOS, Windows, Macintosh systems, perform network administration and student lab management functions, troubleshoot systems to microlabs & offices.

COMPENSATION:
Competitive salaries & excellent fringe benefits.

TO APPLY:
Screening begins July 15, 1996. For candidate requirements and application process, call 812-237-6439 for information packet or see http://web.indstate.edu/acns/main-serv/about/

AA/EOE

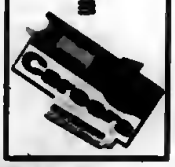
Software Engineer (Atlanta, GA) Analyze/design/dvlp/implmt/modify/enhance customized bus. applics. Interface w/users to debug applics in 3GL to 4GL. Train users as necessary 5 days. 40hr/wk, 9a-5p, $50K/yr. Req Masters-Comp Sci or Comp Eng & 1yr exp in job offd & 1yr exp in Sybase, Powerbuilder & C on UNIX & GUI, OOP, OOD. Send 2 resumes or apply to GADOL, JO# GA 5988265, 2943 N Druid Hills Rd, Atlanta, GA 30329-3909 or nearest DOL Field Srvce Office. An employer paid ad. Must have proof of legal auth to work in the U.S.

System Analyst working within an airline environment, using Airline Control Program/Transaction Processing Facility (ACP/TPF) and Airline Control Systems (ALCS), does analysis, design, coding and implementation of airline reservation functions. Designs, codes tests and implements enhancements to airline ticketing and reservations software. Requires 2 years experience in job offered. Salary $65,000/yr. Applicants should apply to nearest North Carolina Job Service office, or submit a resume for Job Service 630 West Sixth St., Winston-Salem, NC 27101. Resume must include applicants Social Security Number and refer to job order number NC0934888 and DOT code 030.167-014.

Software Engineer: 40 hr/wk; 8-5; $37,623/yr. Design & develop object-oriented software to manage aviation, marine, & communication databases. Design & develop 2D & 3D graphic programs to visualize navigation & communication data. Design & develop DOS & Windows software to interface with navigation & communication products using OWL, Zinc & C++ Research & develop new algorithms & improve existing algorithms to perform navigation & communication data manipulation, compression, computation, conversion & visualization. Conduct software quality assurance procedures. Min Reqs: MS (or completion of of degree requirements) in Computer Science; 1 year in carrying out the duties set forth in the job offer OR 1 year in developing object-oriented DOS & Windows software using C++, OWL & Zinc & in software quality control using revision control system TestCheck. Post development of an object-oriented DBMS & of a 2D or 3D graphic system. Post development of data visualization tools. Please apply with a resume in person to your local Kansas Job Service or send resume to Department of Human Resources, KSWD2221, Attn: Don Bruner, 401 S.W. Topeka Blvd. Topeka, KS 66603-3182. Must have proof of legal authority to work in the United States.

---

http://careers.computerworld.com



Careers

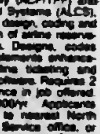
http://careers.computerworld.com

gthi

Recruit top I.T. students from top I.T. Campuses!

Issue Date: October 01, 1996
Close: September 16, 1996

Plan Now!
1-800-343-6474, x6201



CHIEF COMPUTER PROGRAMMER Consults with end user and management to evaluate requests for new/modified computer systems. Schedules project personnel and resources. Develops program structures to model business needs. Converts project specs for coding into INFORMIX 4GL/SQL, UNIX C/C++ and Pascal programming languages. Analyzes program output, tests data input/output flow, assesses program function in terms of management specifications. Administers relational database computes database and program structures for speed and efficiency. Prepares user and system documentation. Trains users. Must have experience with Informix 4GL/SQL/ESQL-C, Informix installation and administration. Must be familiar with MS-Windows, MS-DOS and UNIX operating systems. Must be willing to relocate within U.S. on a project-by-project basis. Computer requirements include Pascal, C, C++, 90 x 86 Assembler, xBase, COBOL-85, Informix SQL/4GL, Informix administration, MS-Access, MS-Windows, MS-DOS, Unix v.4, Relational Database design. Must have B.S. Degree or equivalent in Elect. Engineering or related and 4 years work experience. Hrs. 9a-5p, M-F, $68,400 per yr. Apply to Georgia Dept. of Labor, Job Order #GA 5988055, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3909 or the nearest Dept. of Labor Field Service Office.

Chief Programmer Analyst. 40 hrs/wk. 8:30 am - 5:00 pm. $60,000/yr. Conduct analysis, design, programming, testing and maintenance of software applications using ORACLE Relational Database Management Systems, (RDBMS), and ORACLE tools on UNIX operating systems. Culminating to delivery and maintenance of a software system to users, perform liaison functions with users to collect business requirements, conduct physical design of ORACLE application databases, conduct performance monitoring and tuning of software applications and ORACLE database, conduct quality assurance and audits of analyses and design models in software applications. Direct subordinates on program implementation. Requirements: Bachelor of Science degree in Electrical Engineering or Computer Science. Experience must have included 6 years conducting analysis, design and programming in ORACLE RDBMS and SQL*Plus, SQL*Forms, PL/SQL, Pro*C. Experience must have also included 6 years development in UNIX operating systems, 6 months experience in quality assurance reviewing and auditing of software projects. Experience may have been gained concurrently. Must have proof of legal authority to work permanently in the U.S. Send two copies of resume to Personnel Department, 8787 Baymeadows Road, Jacksonville, Florida 32256. Employer paid advertisement.

Programmer/Analysts

FLORIDA

Great opportunities, great lifestyle!

Located in America's fastest growing region, **INTERIM TECHNOLOGY**, formerly Computer Power Group, has changing full time and consulting positions for software developers and other IS Professionals in Ft. Lauderdale, Miami and Jacksonville. Excellent hourly or salary + benefits for individuals with the following:

IMS DB/DC;
COBOL/JCL/VSAM;
CICS/COBOL/VSAM;
VISUAL BASIC;
POWERBUILDER;
LOTUS NOTES ADMIN;
CA/IDMS-CA/ALLIANCE;
BUSINESS ANALYSTS;
SOFTWARE TESTERS;
TECH WRITERS;
TRAINING MANAGER

FAX resume 1-800-951-1046 or CALL Nancy Burdette, 1-800-955-8781 x11

SOUTHEAST

- **DB2/OCS/APS**
- **IMS DB/DC**
- **EASYTRIEVE +**
- **ADABAS/NATURAL**
- **SAP/ABAP**
- **SYBASE/POWERBUILDER**
- **IDMS/ADS/O**
- **DELPHI**
- **C/OS/2**
- **AIX/UNIX/C++**

Contract Services
Competitive Salaries
Hourly Rates
Outstanding Benefits

ACP
PO Box 11159
Columbia, SC 29211
800-933-9277 or (803) 256-2343
FAX (803) 779-1955
ACP@ACP.COM
http://www.resourcecenter.com/acp
EOE

Full-time Jr. BIOS (Basic Input Output System) Engineer responsible for programming the hardware of computers enabling them to operate correctly before the Operating System is installed. Responsible for adapting the BIOS to different hardware platforms. Modify the existing BIOS so that it is compatible with various hardware designs of personal computers. Customizes the BIOS when a particular OEM (Other Electronics Manufacturer) has a motherboard that incorporates extra features. Must maintain existing Assembly source code. Provide customer service to the OEMs and contacts the Hardware Designers to research specific hardware details of products under development. Must have a Bachelor's degree in Electronics Engineering. Must have educational or work background with Microprocessor theory and programming 80X86 Assembly Language. Some travel required. Salary 35,000/year. Send resume to: CW-176180, Computerworld, Box 9171, Framingham, MA 01701-9171 or fax to 508-620-7720 referencing CW-176180

Programmer/analyst (Consultant) .Design & develop custom operational support systems (eg, accting, systems) according to clients' functional reqs using employer's rel. d/b env & 4GL app. dev. tools & Pro*C programing. Analyze clients' Business info. Flow reqs. using CASE. formulate enterprise models, & design & develop custom applications. Sr. position involves coordinating & directing less senior consultants & training users. Must have BSCS/EE, MBA or equiv & min. 5 yrs. exp. in analysis & design of rel. d/b business systems. Exp must include CASE tools & methodology, modeling techniques, RDBMS tools, & operating systems (including Unix, VMS, MS-Windows & DOS). $55,000/mo. More than 50% travel. home office in Atlanta, GA. Apply or person or by resume to Georgia Dept. of Labor, Job Order # GA 5986954, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3909 or the nearest Dept. of Labor Field Service Office.

COMPUTER PROGRAMMER/ANALYST Write new computer programs for real and personal property appraisal data-base administration and programs for computer information translation and transfer. Upgrade old computer programs versions and develop new applications using Oracle 7.1, Sun O/S 5.3, Solaris 2.4 & VFoxPro. A working kn. Judge of real and personal property appraisals required. Requires M.S. degree in the field of computer engineering. $718.00 per wk. 40 hrs/wk. Job Location: Memphis, Tennessee. J.O.#TN6200183. Send resumes to Charles Turner, TN Dept of Employment Sec, P.O. Box 11988, Chattanooga, TN 37401. Must have proof of legal authority to work permanently in the United States.

SOFTWARE DEVELOPERS

AS/400, COBOL
PROGRESS
UNIX/NT ADMIN
SYBASE/ORACLE DBA

The Vantage Group, Inc., is a $45 million direct mail marketing company servicing the affinity not-for-profit marketplace by providing group travel and financial services to organization members.....

Programmer/Analyst

In this position, you will develop and maintain systems supporting our travel business. Position requires 3-5 years' experience on AS/400 with RPG/III and CLP and practical knowledge of PDM, SDA, and RLU. Must be a self-starter capable of working with minimum supervision. Experience with Office/400, PC Support, Novell, PCs and MACs desirable.

Computer/Tape Operator

As an AS/400 computer operator, you will be responsible for preparation of tapes for major direct mail processor and for supporting end users with technical issues on the AS/400. Duties will include address standardization, processing, and tape preparation for mailing. Knowledge of PC networks a definite plus.

Easily accessible to Public Transportation. We offer comprehensive group insurance, 401(k) plan, other benefits, onsite exercise facility, and a non-smoking environment. Please send resume indicating position of interest to:

THE VANTAGE GROUP, INC.
Human Resources, 58 Cypress St.
Brookline, MA 02146. EOE.
Fax: (617) 232-1562

Chief Computer Programmer Consults with appropriate user personnel to build new Logical Data Models or re-engineer existing ones. Determines intent of program, identifies problems, suggests changes and determines extent of testing required. Converts Data Models to program code. Builds databases, tables and writes stored procedures. Balances the data flow between program and database. Enters test data and analyses test runs. Conducts revision of programs using program control systems, such as PVCS. Completes documentation and writes HELP systems for programs. Writes reports. Develops new tools and programming methods. Trains subordinates. Must have experience in S-Designer Windows Powerbuilder 4, Sybase Systems-10. Must be willing to relocate within the U.S. Required computer applications: Programming with Powerbuilder, Uniface, C, C++, Clipper, Basic. Networking using TCP/IP, DEC-NET, SCANET, Novell 3.11, 4.1. Use of operating systems UNIX, Ultrix, SUN-OS, Solaris, Windows, OS/2. Use of hardware such as DEC-VAX, IBM PC's, SUN'S, IBM AS 400, IBM RS6000. Specialties: Must have Master's Degree or equiv. in Computer Science or related and 6 years work experience. Hrs. 9a-5p, M-F. $61,250 per yr. Apply in Georgia Dept. of Labor, Job Order #GA 5987783, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3909 or the nearest Dept. of Labor Field Service Office.

Full time Associate Network Programmer responsible for developing new, or maintaining and enhancing existing, communications software modules for use on various hardware platforms (PC's, Unix, HP3000, Servers, Network LAN's), by employer's applications developers. Will use several third party software tools to maintain day to day information System activity. Will test and document new or modified applications. Must have Bachelor's degree in Information Systems or Computer Science. Educational or work background must have included development of communications software written in the "C" Informix 4GL, or Unix Shell Script programming languages in an MS-DOS/Novell Netware environment. Annual salary is $34,500.00. Must have proof of legal authority to work in the United States. If interested, please report in person or send rest resumes to: Georgia Department of Labor, Job Order #GA 5986389, 485 Big Shanty Road, Marietta, GA 30066-3303 or the nearest Department of Labor Field Service Office.

ICS
Computer Services is a premiere system integration, training, and custom software development organization. ICS is seeking Systems and Data Architects, Analysts, Programmers, and Communications Experts in Main Frame and Client/Server environments. In addition, ICS seeks industry experts in Banking, Healthcare, Manufacturing, and technical experts in Multimedia and Microsoft. The following are typical skills required:

- MVS/CICS/INFORMIX
- ORACLE/SYBASE/INFORMIX/SAP
- VISUAL BASIC/VISUAL C++/POWERBUILDER/C++
- C/MICROFOCUS COBOL
- COBOL/CICS/NATURAL
- IMS/DB2

ICS has offices in Pittsburgh, Philadelphia, Atlanta, Phoenix, Cleveland, and San Francisco.

ICS Computer Services, Inc.
777 Penn Center Blvd., Suite 600, Attn: CWS, Pittsburgh, PA 15235-5704
Phone (412) 823-8432
Fax (412) 823-8821
http://www.icsnet.com/

Analyst, Application Support Resp for distribution/manufacturing S/W support for process manuf planning. Resp for spt processing, problem assessment, data collection to determine problem cause & providing info to correct problems/provide plants w/ workarounds until a permanent solution can be developed. Reqs: BS in Process Manuf -related field such as Chem. Eng, Manuf Planning Manuf Operations or Business w/ emphasis on Manuf. Operations & 2 yrs of exp in job offered or in production planning using automated systems. Also reqs interface exp w/ other areas impacted by production planning (Purchasing, Accounting, or Inventory Control/Distribution) exp training users on S/W applics., user support exp., proven tech. writing skills; willingness to work/be on call on weekends & holidays, & willingness to pursue CPIM through APICs. Salary $37,500/yr. Job & interview site Atlanta, GA. Send this ad & 2 copies of your resume to the Georgia Department of Labor, Job Order #GA5985333, 2943 N. Druid Hills Road, Atlanta, GA 30329-3909 or the nearest Department of Labor Field Service Office. Must have proof of legal authority to work in the U.S.

ITT HARTFORD
INFORMATION MANAGEMENT

ITT Hartford's highly respected Information Management organization, recently recognized by Computerworld Magazine as one of the Top 100 users of Information Technology in the world, is a collection of exceptionally motivated and innovative individuals working in a growing and dynamic environment. As a company committed to diversity in hiring and promoting, we are currently seeking the following individuals for our *Hartford and/or Simsbury locations:*

Network Design Specialist - Will spearhead direction for VOICE environment at multiple levels, integrating new technologies and platforms. Requires 5+ years' designing and implementing large call centers or business telephony systems; knowledge of ISDN, PBX, VRU/IVR, CTI. Experience with Rolm and Northern Telcom PBX products a plus. **(ref. code: HAD6086)**

Strategic Network Specialist - Establishes strategies and standards relating to emerging communications technologies and network infrastructures. Requires experience with LAN, MAN, WAN, VAN, Internet, TCP/IP. **(ref. code: HAD76752)**

Application Developer- Support Distributed Application team in a DEC ALPHA environment; monitor monthly extracts, provide customer assistance and enhancements as required. Requires in-depth knowledge of FOCUS in VMS environments. Position at Southington location. **(ref. code: HAD63698)**

ORACLE OPPORTUNITIES

Developer - Write applications (4.5) in client/server environment; GUI development, HP UNIX and Windows. Experience with annuity business a plus. **(ref. code: HAD74864)**

Integrator - Interact with business partners, development teams and support staff for installations/upgrades, performance monitoring, recovery planning, problem resolution in Oracle 7. Experience in multi-instance, multi-processor (HP-UNIX) environments preferred; in analysis and database design. BS preferred. **(ref. code: HAD11745)**

D.B.A. - Develop and administer Oracle environment in support of investment systems. 2+ years' experience in Oracle DBA required. **(ref. code: HAD76578)**

Designer - Design and maintain data warehouse in Oracle 7 environment. Experience with PL/SQL and relational database aptitude required. **(ref. code: HAD71079)**

Developer - Identify and define solutions to business requirements for Disability Claim System. Requires Oracle SQL Forms/Plus and strong analytical skills. **(ref. code: HAD44326)**

ITT Hartford offers a competitive salary (commensurate with experience), excellent benefits and a positive environment that rewards your accomplishments. Please forward your resume with salary requirements, indicating reference code, to:

Wayne Rahrdy
Human Resources
ITT HARTFORD
Hartford Plaza
Hartford, CT 06115
Fax: (860) 843-6875

No One's Better Prepared for Tomorrow

Qualified applicants only.
Equal Opportunity/
Affirmative Action Employer.

ITT HARTFORD

http://careers.computerworld.com

Careers

FLORIDA

- JAM 5.0/JYACC
- COBOL 97/362/OCS
- FOX/PRO/WINDOWS
- ORACLE DBA/UNIX/C
- AUTOCAD/AUTOLISP
- D&B E SERIES/COBOL
- VISUAL BASIC/ORACLE/C
- MS ACCESS/VISUAL BASIC
- RPG 400/COBOL/AS400
- VISUAL BASIC/C/C++/DELPHI
- ANALYST FULL LIFE CYCLE
- CA/IDMS/INFORMIX/VIS BASIC
- COBOL/AS400/PEOPLESOFT
- C++/HP-UNIX/SQL/INFORMIX
- UNIX SYSTEM ADMIN/BE/ST/I
- PICK PROGRAMMER/UNIVERSE

FOR IMMEDIATE CONSIDERATION CALL OR FAX RESUME TODAY

Syslogic
(800) 787-5644 (813) 287-0054
P.O. Box 26149, Tampa, FL 33623
FAX (813) 282-8511

INFORMIX
NewEra
Consulting Partner

Software

Software Research & Development person for large law firm. Must have minimum three years law firm software experience. Excellent salary & benefits.

Qualified person apply to:

Executive Director
PO Box 32092
Lakeland, FL 33801

SOUTHEAST

ISG

Lucent means "glowing with light" and "marked by clarity." For you, it means an opportunity to help redefine the leading edge.

As a dynamic, high growth telecommunications leader, Lucent Technologies was formerly known as AT&T's systems and technology businesses. As we take our innovations in communications forward, we have needs for results-oriented professionals to partner with our sales team to integrate new call center technology and solutions for customers.

[redacted]

Selected candidates will provide onsite ACD training; analyze call flow; compose vector designs; and develop custom reports. Performing onsite analysis of existing customer call center operations and making recommendations to maximize operational efficiencies will also be involved.

A Bachelor's degree/equivalent work experience and thorough working knowledge of call center operations technology (ACD, PBX, IVR) are required. Along with excellent verbal/written communication skills, training, presentation and negotiation experience is needed. Call center management experience is desirable. 70-80% travel and customer interface will be involved. When not traveling, our Consultants work in a virtual office.

We offer excellent compensation and benefits. For immediate consideration, please send your resume to: Lucent Technologies, ICS Call Center Staffing, 340 Bansome St., 10th Floor, San Francisco, CA 94104. An equal opportunity employer.

Lucent Technologies
Bell Labs Innovations

Hogan specialists get all the best choices.





The timeless landscape of Australia. Or the time of your life in Hong Kong.

This is a rare opportunity for frustrated adventurers, looking toward far horizons and exotic experiences. As a business unit of the world's most successful systems integrator, we're looking to fill a wide range of positions for Hogan specialists.

We urgently require business analysts, functional analysts and analyst programmers with experience in Hogan DDA, TDA, CIS, ODS or IL5 for prestige sites in Australia and Hong Kong.

These are medium to long term assignments featuring extremely attractive earnings and world-leading technologies in excellent working conditions.

For the wide open spaces of Australia contact Wayne Norrie via email: wayne.s.norrie@ac.com or telephone: (+613) 9286 7055, mobile: (+61) 18 311 546, fax: (+613) 9286 7522.

For the colour and excitement of Hong Kong contact Peter Maruff via email: peter.maruff@ac.com or telephone: (+852) 2853 5855, fax: (+852) 2854 4097.

Call now for the best choices the world has to offer.

Contract & Full Time IS Positions in the Carolinas

- COBOL/DB2 P/A
- ORACLE DBA
- TERADATA DBA
- POWERBUILDER/SYBASE/ORACLE
- UNIX SYS ADMIN W/SUN SOLARIS AND/OR HP/UX, AIX, SP/E
- AS/400 W/RPG P/A
- HP3000 W/IMPE
- DATACOM/IDEAL P/A

(Minimum 3 years industry experience)

Mercury Data Systems, Inc.
301 South Elm St. Suite 307, Greensboro, NC 27401
Fax: 910/275-4547 Phone: 910/275-3194

ORACLE HR
PEOPLESOFT
ADP CSS
TESSERACT
CYBORG
INTEGRAL

We are a publicly held systems integration firm and a leading provider of HR systems solutions to clients throughout the U.S. We offer highly competitive compensation packages in a people-oriented environment. Full-time and contract opportunities now exist for both technical and functional HR systems experience. Training in new technologies is available for our employees. Travel is required for many positions. No relocation is necessary. For consideration and information contact Robert Ferrell of The Consulting Teams, a subsidiary of Affiliated Systems Inc., Gaithersburg, 6100 St. Andrews Rd., Columbia, SC 29212. Fax (803) 772-4279. Phone (803) 798-7885. EOE.

[redacted]

PROJECT MANAGERS
TEAM LEADERS/ CONSULTANTS

IPR INC

Better → BEST

Enjoy the Pacific Northwest lifestyle with the best of the BEST. Projects range from new development for mainframe developers to designing solutions for complex systems integration challenges. Excellent partnering relationships with client base. Generous salaries · cafeteria-style benefits · constant training opportunities. To learn how you can benefit from our growth track, contact or send resume to:

BEST Consulting
700 S.E. Baltimore, Suite 1100
Portland, OR 97232
(503) 236-5776 (503) 236-5704 FAX

- Visual Basic
- Visual Basic C++/API
- Windows API + OLE
- Excel + Access

Principal Software Engineer. As a Principal Software Engineer in a nuclear medicine engineering department, design & develop foundation software necessary to support the generation of medical application software that will run unmodified (with only recompilation) on a variety of UNIX workstations. Understand & address (shielding from the application developers) the differences in the UNIX variants developed by the following vendors: Hewlett Packard, SUN, Silicon Graphics & DEC. Utilize Object-Oriented Software Design Methodologies (modified Shlaer-Mellor & Rumbaugh methods) in the design of a system that focuses on maximum reuse of existing modules & subsystems, portability (ability for software to function on multiple hardware platforms) & distributed processing (ability as system to take advantage of remotely located system resources when performing time critical calculations). Develop system that utilizes computer processing units (CPU's) that exist as the network, taking advantage of idle cycle times/horsepower. Master's degree in Computer Science and 2 years experience as a Principal Software Engineer or 2 years experience as a Computer consultant and/or Junior Software Engineer or any combination thereof. Employment or academic experience must have included utilizing the Shlaer-Mellor software design methodology as the design of client-server architecture that has been implemented on several UNIX workstations. Experience must also have included upgrading and maintenance of a software configuration management system that supports multiple UNIX platforms together with the management of a large installation of PC/workstations. Employer will accept applicants who performed as a Junior Software Engineer with the title of Trainee Engineer or Development Executive (Application Software) 40 hours M-F, 9:00 a.m. to 5:00 p.m., $54,000 per year. Must have proof of legal authority to work permanently in the U.S. Send resumes to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605 Attention: Ruth Daniels, Reference V-IL-14432-R. NO CALLS. AN EMPLOYER PAID AD. SEND 2 COPIES OF RESUME AND COVER LETTER.

SAP

IN SOLUTION IMPLEMENTATIONS

ALL MODULES
Functional • Technical
ABAP • BASIS
Positions throughout the U.S.

Structured Logic Company, Inc.

[redacted]
Atlanta, GA 30328
800/598-0580
FAX: 770/837-8423
e-mail: sls11@aol.com

Software Engineer, 40hrs/wk., 8am - 5pm, $36,570/yr. Design, develop, code & test software for business applications. Technical review/inspection of designs & codes. Tools: UNIX; MS-DOS; C; C++; COBOL; Excelerator; PowerBuilder; MVS; DB2. M.S. in Computer Science as well as one year experience in job offered to as Programmer/Analyst required. Previous experience must include: UNIX, MS-DOS, C/C++; COBOL; Excelerator; PowerBuilder; MVS; relational database. Must have proof of legal authority to work permanently in the U.S. Send two copies of cover letter & resume to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605. Attention: Janet Anderson/Gregory. Reference #V-IL-15421-A. NO CALLS. An Employer Paid Ad.

SOFTWARE ENGINEER required. Analyses, modeling, design, development, implementation & testing of Client/Server distributed applications using object oriented design & implementation methodologies. Develop GUI's on UNIX platforms using C/C++ applications level TCP/IP, UNIX System Calls, Lex/Yacc, Shell Programming & X/Motif. Masters Degree in the equivalent required in Computers, Math or Engineering, plus 1 year experience in the job duties described above. University work experience (other than mere classroom study) may be used to satisfy the experience requirements. Must have proof of legal authority to work in the U.S. Salary - $44,000/year for a 40 hour work week. Apply at the Texas Employment Commission, Fort Worth, Texas, or send resume to the Texas Employment Commission, 1117 Trinity, Room 4247, Austin, Texas 78701. J.O. #TX7305282. Ad paid by an Equal Opportunity Employer.

Systems Analyst/Programmer (3 positions, Anneheim, CA) - Consult w/ national & multi-nat'l clients re their reqmts for systems into processg progmg; revise & create system & functional specs utilizing C++ & C language; code, test & maintain various 4th & 5th gen & database apps using DB2 & C language; code applctn programs; write software progms & devise testg methodology utilizing as tools inclu: Visual C++ & Visual Basic in a PC environs, & DB2 & C to IBM mainframe environs. B.S. to equivalent to Comp. Sci. or Commerce + 2 yrs exp to 2 yrs as Software Programmer/Analyst w/previous exp to incl analysis, db design & implementation using C, C++ & Visual C++ w/in a PC environs, use of DB2 & C language to IBM mainfr environs. Will req sh'long term relocatn to co. expense to var client sites to US to meet co. contract obligations. 40 hrs/wk, 8am-5pm, OT as needed, $57,500/yr. +$20,448/yr OT. Send ltr/resume to dwpl to Job #81167113BP, P.O. Box 269055, Sacramento, CA 95826-9055.

Software Engineer. Object oriented design, implementation, debugging and maintenance of cross-platform commercial software (program components that run under Windows and Mac, and tool suites) including graphic users, e-mail and on-line communication products for Windows and Macintosh environments. Must have excellent ability to read undocumented design, good programming, C/C++, SQL, Intel 386 Assembler, cross-platform programming for Windows or Macintosh. Abstract, MFC and OWL. B.S. in computer science or equivalent field and 5 years experience in software development, programming or related experience. 40 hrs/wk., $42,910/yr. 4 openings. Must have proof of legal authority to work in the United States. Send resume to Limited Status Service Center, 315 Elm Street, Des Moines, IA 50309-1727. Job Order No. IA 1180016. Employer paid advertisement.

Systems Engineer, 40 hrs/wk, 8am-5pm, $41[illegible],000/year. Analyze, design, and develop software to be used for ATM machines and other security products to be distributed worldwide. Convert any customer and technical requirements to formal programmable by computer. Resolve problems of concurrency, and other effects may arise from implementation. Test and install in customer's production environment. Prepare documentation in Computer Science and Business Administration in the job offered. Must have proof of legal authority to work in the United States. Send resume to Limited Employment, Nebraska Department of Labor, P.O. Box 94600, Lincoln, Nebraska 68509. Refer to Job Order: NE 0160516. This advertisement is paid for by the employer.

Systems Analyst - Analyze, design, develop, enhance & modify network, apps/s applics using OS/2 Presentation Manager, ASN.1, TCP/IP, SNMP, OSI/2 Communications Manager/2 & SNA. Provide technical support. Bachelor's/Comp. Sci/Engr/Math. 18mos/exp. to job offered to 18mos as Software Engr &/or Prog Exp. in job offered must incl 6mos using OS/2 Presentation Manager, ASN.1, TCP/IP, SNMP, OSI/2 Communications Manager/2 & SNA where 40hrs/wk; (8-5) $44,300/yr. Client sites in Raleigh/Durham, NC & Cox Inc in Charlotte, NC. Apply to the nearest Job Service office or submit a resume to: Job Service, 1105 Briggs Ave., Durham, NC 27705. All resumes must incl. applicant's Social Security #. Job Order #NC0256603. DOT code 030.167-014.

Project Engineer - Phoenix, AZ. for Analysis, design, development, testing and implementation of large client-server electronic document authoring/publishing/processing systems using SGML, OmniMark, ADEPT*PUBLISHER, MOTIF/C for GUI, ORACLE RDBMS, SQL Pro/C, PL/SQL, SQL*PLUS, SQL*LOADER, IPC (Interprocess Communication) on IBM/AIX workstations; and Sentinel for run-time analysis of constituent tools. 8 to 5, M-F, 40 hrs/week, $50,000 annum. Require MS in Computer Science or Equivalent degree and 1 year's experience in the job offered or as a Project Engineer, Software Engineer, Software Developer Programmer/Analyst or Equivalent. Industrial Position Experience must include analysis, design, development, testing and implementation of UNIX based client-server electronic document assembly systems using SGML, OmniMark, MOTIF, ORACLE RDBMS and its tools; and work with IPC between clients and servers. Must have proof of legal authority to work permanently in the U.S. Send resume to A. Nath, CGN & Associates, Inc., 415 Southwest Washington Peoria IL 61602. An employer paid ad.

SOFTWARE ENGINEER

Analyze, design, develop and implement massive (Terabyte Systems) real-time database systems. Define and classify problems associated with very large scale, real-time databases and retrieval systems. Develop client/server based ROBMS applications in Sybase (System 10), ORACLE version 7.0, OMNIS 7 and related CASE tools. Perform systems and needs analysis, data and process modeling, data normalization and database administration of Sybase (System 10) and ORACLE version 7.0 and database performance tuning. Master of Science degree required in Computer Science plus 1 year of experience in the job duties described above as either a Software Engineer or a Systems Analyst. The 1 year of experience must include Writing Shell scripts on Solaris and SunOs environments and using graphical user interface tools such as: SQL*DBA, SQL*Forms, SQL*Reportwriter, Pro*C, PL/SQL, T-SQL, SQL*MENU, SQL*Loader, Visual C++ and Visual Basic. Salary: $47,000/year for a 40 hour work week. Apply at the Texas Workforce Commission, Fort Worth, Texas or send resumes to the Texas Workforce Commission, 1117 Trinity, Room 4247, Austin, Texas 78701, JO# 7X7858807. Ad paid by an Equal Opportunity Employer.

Programmer/Analyst - 40% of time at client sites in CT, Rhode Island & MA, & 60% of time at Cox Inc in Westmoreland, MA. Analyze, design, develop, implement & maintain applications. Provide technical support to end users. Utilize FoxPro, PowerBuilder, Watcom SQL software & EasyCase used tool. Bachelors/Comp Sci., Engg or Math. 2yrs/exp. in job offered or 2yrs as Software Engr. Exp. in job offered or related occ must incl. 2yrs/exp. using FoxPro, PowerBuilder, Watcom SQL & EasyCase used tool. 40hrs/wk (8-5, M-F) $60,000/yr. Send resume to dwpl to Case #60464, PO Box 46998, Boston, MA 02114.

The most powerful choice is also the



BUSINESS CONSULTING

Superior knowledge. Tested methodologies. Creative solutions. At Arthur Andersen, the world's premier professional services firm, our energetic team of Business Consulting professionals is taking unsurpassed client service to new levels.

Due to explosive growth in our Metro New York practice (NY, New Jersey, Stamford, CT, Long Island, and Rochester), extraordinary opportunities exist for professionals with information technology skills and experience with a recognized, leading management consulting firm ("Big 6" or other consulting environment) or related corporate experience). Good communication, organization, leadership and supervisory skills, along with the willingness to travel and the ability to manage multiple projects, are essential. Your strong academic background must be complemented by a significant record of achievement in current and past positions, high-level of enthusiasm and top analytical skills.

Current openings include the level of Consultant and Manager with a minimum of four years experience

- Experience in systems planning, design and implementation
- Manufacturing Systems Implementation Experience (QAD, BAAN, BPCS, JD Edwards)
- Financial Systems Implementation Experience (DBS, Oracle, Peoplesoft)
- Retail Systems Implementation
- Health Care Systems Implementation Experience in Integrated Delivery Systems
- Client/Server Development Experience (Powerbuilder, VBA, Oracle)
- Proficiency in LAN and WAN environments
- Sales & Marketing Strategic Consultant

In addition to an excellent salary and benefits package, you will find an environment that offers diversity, challenge and growth. For consideration, please forward your resume with salary history and requirements to: **Arthur Andersen, Director of Recruiting, Room 1210, 1345 Avenue of the Americas, New York, NY 10105.** We will only respond to qualified candidates that match the locations with specific openings. We are an Equal Opportunity and Affirmative Action Employer.

ARTHUR ANDERSEN

LIMITLESS CAPABILITIES
& endless possibilities.

NCR has built a solid reputation by providing world-class computer products and services. Our belief in nurturing strong customer partnerships, providing state-of-the-art products, and valuing each of our employees has made us a leader in Data Warehouse Solutions, the #1 vendor in the Massively Parallel Processing Market, and the market leader in the medium scale UNIX Market. As we continue to build an even stronger presence, we seek professionals who can make a difference in our future and the future of our clients.

ENTERPRISE SYSTEMS SALES

NCR is the industry leader with over 10 years experience designing, implementing, and managing Data Warehouses for Fortune 50, 100, and 500 companies. NCR's WorldMark™ is recognized as the industry's leading SMP and MPP server platform.

NCR is seeking professionals for opportunities in Atlanta, Boston, Chicago, Cincinnati, Milwaukee, New York City, St. Louis, Washington, DC, and Florida.

LARGE SYSTEMS COMPUTER SALES SPECIALISTS

Selected candidates will plan and execute WorldMark™ server sales for named accounts. Must have large systems computer and solution sales experience as well as knowledge of industry IT trends. Knowledge of Decision Support Systems (DSS) and relational databases (DB2, Teradata, Oracle, Informix, and Sybase) desired. Specific industry experience preferred, but not required.

Successful candidates must have major account sales experience, consistent sales achievement over quota, excellent communication, negotiation, organization, and planning skills, and experience working in a team environment. Job Code: CSS

TECHNICAL ACCOUNT MANAGER

Selected candidates will act as the technical manager for sales teams, and will be the focal point for, and coordinator of, all technical issues for named accounts. Must have experience in Data Warehouse and transaction processing applications, and technical consulting and support experience. Specific industry experience preferred, but not required.

Successful candidates will have sales experience and consulting abilities, as well as excellent communication and presentation skills. Technical degree preferred. Job Code: TAM

#1 IN DATA WAREHOUSING

DATA WAREHOUSE CONSULTING

Successful candidates will have professional consulting abilities, excellent interpersonal skills, an innovative approach to problem solving, the ability to work in a virtual environment with a team orientation, and a strong commitment to quality and customer service. Bachelor's degree desired. Master's degree preferred. Willingness to travel required.

Our rapidly growing practice is seeking professionals for opportunities in Atlanta, Boston, Chicago, Dallas, New York City, Philadelphia, Washington, DC, and Toronto.

DATA WAREHOUSE SENIOR CONSULTANTS

Qualifications include: proficiency in Logical and Physical Data Modeling and design, as well as familiarity with MVS and UNIX. Data Transformation/Migration tools, relational database technology (DB2, Teradata, Oracle, Informix), GUI development tools, and developmental project plans to an application development environment. Big 6 or equivalent experience is strongly desired. Job Code: SC

DATA WAREHOUSE PROJECT MANAGERS

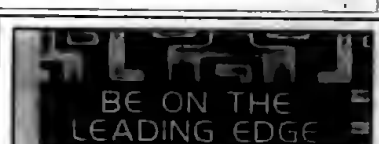
Selected candidates will develop project proposals, recommendations, action plans, and budgets. 6 years progressively responsible IT experience encompassing staff/team management, as well as project management and consulting experience required. PMI certification preferred. Job Code: PM

NCR offers a competitive salary, incentive bonus, and generous benefits with an exceptional opportunity to grow and learn in a new and challenging environment. For confidential consideration, please send or fax resume, indicating position of interest to: **NCR, Job Code (indicate appropriate Job Code), 6870 Koll Center Pkwy., Pleasanton, CA 94566; FAX: (510) 417-1806.** An Equal Opportunity Employer

NCR

PROGRAMMER ANALYST (2 positions) 40 hrs./wk., 8am-5pm, $36,000/yr. Develop program specifications and application programs in a software development project utilizing C, MS-Access and Quick Basic. Carry out preparation of test data, perform testing and provide assistance in implementation. Req: Bachelor's degr. in Computer Science, Electrical or Control Systems or Mechanical Engrng. and 6 mos. exp; or job offered in 6 mos. exp'r. in Systems Analysis &/or S/W Engineering &/or Programming &/or Computer Consulting &/or Graduate Research Assistant. Resr. experience in developing s/w systems and with C, MS-Access and Quick Basic. Employer is S/W development/consulting firm. Relocation to various client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref #76806.

Project Leader/Systems Analyst - client sites in metro Chicago, IL & Co. loc. in Lisle, IL. Design, develop, install various s/ware. Set up configurations, improve s/ware cycle processes. Lead system test team on GUI design. Use Visual C++, X Designer, Visual Basic, MS SQL Server, Win-NT, X Runner, X Windows. Bach. Comp. Sci., Engg. or Math. 2yrs' exp. in job offered or 2yrs. as Grad. Asst. &/or Prog. &/or Progr. Anal. Exp. in job offered or related exp. must incl. 1yr. using Visual C++, X Designer, Visual Basic, MS SQL Server, WinRunner & X Runner s/ware. 40hrs/wk (8-5, M-F) $42,000/yr. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of both resume & cover letter to: Illinois Dept. of Employment Security, 401 South State St., 3 South, Chicago, IL 60605. Attn: Dennis Jones. Ref. # V-IL 15498-D. AN EMPLOYER PAID AD. NO CALLS.



ROMAC International, a publicly traded company is experiencing spectacular growth. This achievement has created unlimited opportunities for IS professionals with at least two years experience with the following technologies:

CLIENT SERVER
• SYBASE • POWERBUILDER • ORACLE • INFORMIX
• PEOPLESOFT • LOTUS NOTES • C++ • VISUAL BASIC

MAINFRAME
• COBOL • CICS • DB2 • ASSEMBLER

MIDRANGE
• AS/400

Individuals who thrive on challenges and a fast-paced environment are encouraged to join us on the leading edge. Openings exist for both full-time and contract employees. Our offices are located in **Atlanta, GA; Boston, MA; Chicago, IL; Dallas, TX; Ft. Lauderdale, FL; Andover, MA; Louisville, KY; Philadelphia, PA; Tampa, FL; and Houston, TX.** ROMAC offers outstanding fringe benefits including stock options and 401(K), training, relocation reimbursement, and performance bonuses.

Please send resume to:

ROMAC INTERNATIONAL
PHONE: 800-395-5575
FAX to: Cindy Marvin at 813-251-3493
E-MAIL: cmarvin@romac.com
Equal Opportunity Employer

Consultant. Design, develop & implement an Advanced Intelligent Network System using object-oriented design methodology to provide telecommunication network management & surveillance service. Tools: SS7, TCP/IP X.25, FTAM, CCITT/ITU X.400 series, X.200 series protocols using UNIX, C, C++, real time database, Oracle, SQL, RPC. M.S. in Computer Science as well as 2 yrs. in job offered or as Software Engineer required. 2 yrs. previous experience with UNIX, C, C++, TCP/IP, X.25, CCITT/ITU X.400 and X.200 must include 6 months with FTAM and JAM. 40 hrs./wk., 8am-5pm., $50,000/ yr. Must have proof of legal authority to work permanently in the U.S. Send resume to: Unisk, Inc., Attn: [illegible], Site 350, Oak Brook, IL 60521, (708) 573-6888. REF#081796.

COMPUTER PROGRAMMER ANALYST. Design, develop, test, integrate, support custom built Client/Server based software for business applications and Management Information Systems using Oracle, Sybase, MicroSoft SQL Server under UNIX/DOS, Windows/NT & C environments. Design, develop Graphical User Interfaces using PowerBuilder with Dynamic Data Exchange into Wordprocessors/Spreadsheets using third party tools such as PowerTool, Graphtalker, and also to convert mainframe applications to client/server technology. M.S. in Computer Science + 1yr exp. req'd. $62,000 /yr. 40hrs/wk. Must have proof of legal authority to work in the U.S. Interested applicants may apply in person or by sending their resumes to: Georgia Department of Labor, Job Order #GA 5887100, 2943 N. Druid Hills Road, Atlanta, GA 30329-2088 or the nearest Department of Labor Field Service Office. An employer paid ad.

ANALYST/PROGRAMMER (Multiple positions) - Design and development of software systems using Synon software application development tools, such as Synon/2E and Obsydian. Consult with users to determine system requirements, design system, tests files and programs, test system performance. Requires 2 years' experience in Synon software application development tools. Must be willing and available to relocate to work sites throughout the US on serial assignments of approx. 3-10 months duration. $52,000/yr., FT, 40hrs./wk. 8-5. Interview Larkspur, California. Send ad and resume to: Human Resources, Synon, Inc., 1100 Larkspur Landing Circle, Larkspur, CA 94939. EOE. Principals only. No phone calls, please.

SOFTWARE ENGINEER
Design and implement C++ knowledge based decision support applications for cargo route planning and selection which will automatically generate a route based upon availability and any restrictions to the time a shipment request is made across the network. Develop applications in distributed client/server (UNIX server, PC Windows) environment by using Object Oriented, Artificial Intelligence and knowledge based expert system methodologies, shared memory parallel processing and remote programming communication and transfer technologies. C++ graphic user interface (GUI, X/Motif, Windows API). Oracle, Informix and Oracle CASE tools and utilities. Develop application design requirements, program simulation, testing and optimization, performance reports, and technical reports and documentation. Perform database data modeling, version control and configuration management. Implement and enhance upgrades. Maintain database, solve problems encountered by users and provide technical support. Master of Science degree required in Computer Science plus 1 year of experience in the job duties described above. Salary $43,000/year for a 40 hour work week. Apply at the Texas Workforce Commission, Fort Worth, Texas or send resume to the Texas Workforce Commission, 7117 Trinity, Room 424T, Austin, Texas 78701, JO# TX7855858. Ad paid by an Equal Opportunity Employer.

TANDEM
COBOL, PATHWAY, TAL, SCOBOL, C, SQL, X.25

STRATUS
PL1, COBOL, C, CM/2

UNIX
SUN, HP, RS/6000, GUI, SQR, Powerbuilder, C++, Visual Basic. Full-time/Consulting Positions available in the US/ASIA/ROAD

UNIVAC
800-586-JOBS
TEL: (516) 677-8686
FAX: (516) 677-1686
EMAIL: tom@stratsys.com
7660 Jericho Tpke
Woodbury, NY 11797

SEATTLE

We have been contracted to search for corporate positions in the following areas: UNIX Syst. Admin. (over 100 positions to fill), UNIX or NT Syst. Programming (close to 40 openings), Communications Mgmt. functions, ARM, & Advanced Computing. PhD required to fill Dir. of Entry Svcs., ARM, Distributed OO, & Syst. Archit. Very attractive compensation, benefit & relocation packages. Please forward resume & salary requirements to Alonzo Consultants, Inc., 1777 So. Harrison St., Ste. 404, Denver, CO 80210. Attn: SCW/Seattle. Fax: (303) 759-9845 or Email: Alonzoinc@AOL.COM.

SAP

We specialize in the placement of SAP professionals and have over 200 openings worldwide for long term contracts and permanent positions. We have low overhead, so we can pay you TOP rates!

People Unlimited
1808 Eastlake Rd. N. #100
Charlotte, NC 28270
Phone: 704-841-1136
Fax: 704-841-1173

SAP PROFESSIONALS

Fast-Growing National And International Consultancy With A Reputation For First-Class Consultant Offers

WORLD-WIDE CAREER OPPORTUNITIES FOR TOP QUALITY PROFESSIONALS

- ▲ EXPERIENCED PROJECT MANAGERS — $ 180 K+
- ▲ TEAM LEADERS — $ 150 K+
- ▲ CONSULTANTS — $ 100 K+

EXPERIENCE IN

- SAP R/3 FI/CO, SD/MM, PP/MM, PM/SM, PS, BASIS AND ABAP
- Other Leading Systems (PeopleSoft, Oracle, Baan, JD Edwards)
- Business Reengineering

Competitive Compensation With Performance Incentives for Strong Professionals With Deep Experience. Comprehensive Benefits Package

Please Fax Resumes To:516-625-9687;Telephone 516-625-9000;Contact Chris Fynn
E-mail: Spear1@interramp.com or visit us at http://www.spearhead.com
Applications treated in strictest confidence

SPEARMEAD
System Consultants (US) Ltd.
99 Seaview Blvd. Suite 340 Port Washington NY 11050



FAX YOUR PIECE OF OUR PUZZLE TO:

CLEVELAND:
Mike Doyle
FAX (216) 449-8005
PHONE (216) 449-8004
6001 D Landerhaven Drive
Cleveland, OH 44124

CHICAGO:
Al Calalang
FAX (847) 619-2988
PHONE (847) 619-2966
1051 Pemmeter Drive
Suite 705
Schaumburg, IL 60173

OTHER OPPORTUNITIES AVAILABLE IN:
ATLANTA, GA (800) 771-2674, (770) 435-7970
BOSTON, MA (617) 684-0004
CHARLOTTE, NC (704) 568-8095
GREENVILLE, NC (864) 297-1398
HARTFORD, CT (800) 741-0244, (203) 633 3608
JACKSONVILLE, FL (800) 725-2674, (904) 737-8955
PORTLAND, OR (503) 223-4417
TALLAHASSEE, FL (904) 878-3096
Equal Opportunity Employer

Computer Management Sciences, Inc.

Professionals With Solutions

ATTENTION CONTRACTORS!

Add your resume information to the Discovery Database and let all the consulting companies that are looking for your skillsets come to you. Assignments and/or positions are available nationwide for absolutely all skillsets. And it costs you absolutely nothing! If you want the added advantage, mail or fax your resume to:

The Discovery System

P.O. Box 37075
Kansas City, Mo. 64136

FAX (800) 585-4293
Voice (800) 222-8751

Assignments: Contract W2 • Contract 1099 • Contract for Hire • Permanent Placement
Positions: Applications Programmer • Database Administrator • Network Administrator • Programmer/Analyst • Systems Analyst • Systems Administrator • Team/Project Leader • Technical Writer

MAINFRAME JOBS

CONSULTANTS

IMMEDIATE INTERVIEWS

MAINFRAME

DB2/CICS • Focus • IDMS/NOMAD
DB2 or CICS • Ingres • IMS
Natural 2 • Informix • MVS
AS 400 • JD Edwards • Unitree
ADSM or HSM • CSP • VAX
SAS • ISPF • VM
IDX • Ideal • VSAM

CLIENT SERVER

Lotus Notes • Informix • C or C++
RDBMS • Visual C++ • Win95/Windows
Sybase • Novell • Sybase
Oracle • Unix • Vb Basic
Lan/Wan • Xplorer • PowerBuilder
Security • Access • HTML/JAVA
Sybase/Informix • ROYPP • OOA/OOD
PowerBuilder • Help Desk • Windows
Visual Mf or VB • SAP • PeopleSoft

Robin Rogers Consulting
Attn: Roger Baker
1155 6th Ave. 20th Fl. NYC 10036
800-421-6145 212-921-1310
Fax 800-770-0388
or Ft. Lauderdale
1401 W Cypress Creek Rd
Ocean Center, Suite 200
Ft Lauderdale, FL 33309
954-489-2700 Fax 954-489-8474

Software Analyst to design, analyze write specifications, code test, implement and document new and existing systems in a COBOL, COBOL II, DB2 and IMS/DB/DC environment to meet data processing needs of client; assist clients in defining requirements and develop project plan, schedule specifications and total implementation of new systems; perform duties using variety of software including TSO, ISPF, Panvalet, Filesid, DB2, SQL, QMF, SPUFI, IMS/DB/DC, MFS, COBOL Workbench, Xpediter/TS in IBM mainframe 30xx, 370 and IBM PC environment. Require Master in Computer & Info Systems. Master coursework must include Data-base Management Systems, Structured COBOL, Specification/Design and Systems Analysis. 40 hr wk 8am-5pm, $40,740.75/yr. Send resume to 7310 Woodward Ave. Rm 415, Detroit, MI 48202 Ref No 63896 Employer Paid Ad.

IEF Consultants!

The sun isn't the only thing that's HOT in Phoenix!

KVG Consultants, inc., located in beautiful Phoenix, Arizona, has both nationwide & international opportunities for talented IEF Consultants!

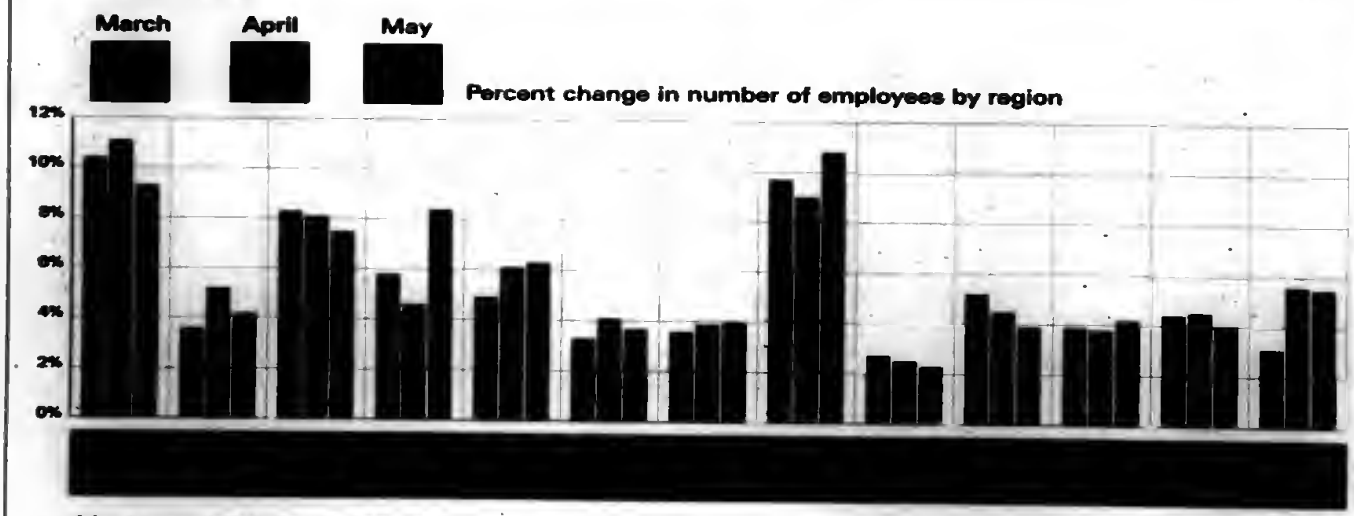
- IEF/Composer 8 5.x - GUI C/S, BM, Batch, Testing, QA
- BAA Full Life Cycle
- Model Manager
- Encyclopedia Administrators
- SAP, Powerbuilder, Visual C, Visual Basic

Salary Range: **$100,000 to $250,000**

Please call or send resume to:
KVG Consultants, Inc.
2600 North 44th Street, Suite 103
Phoenix, AZ 85008
AOL: KVG Vell Internet: KVGVell@aol.com
(602) 953-1372 Fax (602) 494-4195

CorpTech Career Index

National



© Copyright 1996, Corporate Technology Information Services, Inc., Woburn, Mass.

STANDS STRONG

By LESLIE GOFF

TECHNOLOGY ROUNDUP

For all the terror that data loss can invoke, the LAN backup software market is low on drama. The major vendors, Seagate Software, Inc., Legato Systems, Inc. and Cheyenne Software, Inc., enjoy equal stature, if not equal share. Each company offers solid low-end LAN backup software for Novell, Inc. NetWare and Windows NT. Legato and Cheyenne also have Unix packages. Each vendor has staked a claim in a particular niche.

Arcada Software, Inc., now part of Seagate Software's Storage Management Group, captured the Microsoft Corp. Windows NT market by being first out of the starting gate with its LAN backup product, Backup Exec. Cheyenne's ARCserve dominates the Novell, Inc. NetWare market, but Backup Exec and Seagate's Backup Director — formerly from Palindrome Corp., which Seagate absorbed when it acquired Conner Peripherals, Inc. — are also strong contenders. A clear favorite hasn't emerged yet for Unix, but Legato just inked a deal that could propel its NetWorker package to the front of that segment.

Each of the products is strong in basic LAN backup, restore and central administration functions, but they start to diverge when it comes to disaster recovery, data archival and retrieval, and hierarchical storage management (HSM) capabilities, says John Camp, research director at the Network Systems Management Service at Gartner Group, Inc. in Stamford, Conn. The vendors are just starting to get into these areas. Cheyenne offers an extra HSM module for NetWare and some built-in disaster recovery features. NetWorker provides archival and retrieval capabilities. Camp says quite a few products now include data archival and retrieval. Of these areas, the most difficult to find is a disaster recovery feature.

Decisions, decisions

Buying decisions come down to how much users anticipate needing these features on a local basis, media formats and client platforms supported, scalability and the degree to which storage management is decentralized. "Because of bandwidth constraints, users want choices over where storage is managed," Camp says.

Despite tight bandwidth, many users are beginning to recentralize storage management policies, if not the hardware itself, notes Dennis Casey, a research analyst at Strategic Research Corp. in Santa Barbara, Calif. "Users aren't going back to the glass house, but there are efforts to centralize at least the management. So a product's ability to manage backup across platforms is important."

Vendors are responding to this trend by trying to provide a more soup-to-nuts distributed storage management solution.

Pricing among the LAN backup software packages is fairly competitive, and analysts don't expect that to change even with the recent consolidation of the market. ■

Goff is a freelance writer in New York.

PRODUCT SAMPLER

Cheyenne Software
Roslyn Heights, N.Y.
(516) 484-5110 or (800) 243-9462
www.cheyenne.com/

ARCserve for NetWare, Version 6.0: $1,695 for enterprise edition (single server, unlimited users); $695 for workgroup edition (single server, 25-user license)

ARCserve for Windows NT, Version 2.01: $1,395 for enterprise edition; $795 for single-server edition.

ARCserve/Open, Version 2.x: $6,995 for unlimited-client license; $1,695 for 10-client license.

ARCserve provides automatic backup and restore services, disaster recovery, central administration of data management and Simple Network Management Protocol alerts that integrate with network management systems such as Hewlett-Packard Co.'s OpenView and IBM's NetView.

Legato Systems
Palo Alto, Calif.
(415) 812-6000
www.legato.com/

NetWorker for NetWare: $2,100 for enterprise edition (single server, unlimited users); $750 for server edition (single server, 25-user license).

NetWorker for NT: $1,495 for enterprise edition; $995 for server edition.

NetWorker for Unix: $3,000 for enterprise edition; $2,000 for server edition.

NetWorker is a scalable storage management system that can be configured for backup, recovery, data archiving and file migration in large distributed environments.

Seagate Software, Storage Management Group
Lake Mary, Fla.
(407) 388-7000
www.seagate.com/

Backup Exec for NetWare, Version 7.0: $1,395 for enterprise edition; $695 for single-server edition; $495 for single-server, 25-user license.

Backup Exec for Windows NT 6.1: $1,295, for enterprise edition; $695 for single-server edition.

Backup Exec offers automated backup and restore, fault tolerance and concurrent processing on up to 28 devices. Both versions support autoloading and come with an optional Advanced Autoloader Module that will let users segment backup and direct data to user-defined groups.

COMPUTERWORLD MARKETPLACE VENDOR CENTER

(800) 447-0018

Software
3780 RJE Emulation ..... ext. 517
Client/Server
Development Tools ..... ext. 509
Groupware ..... ext. 511
Network Management ..... ext. 512
Remote Access ..... ext. 513
Terminal Emulation ..... ext. 518

Computers/Peripherals
Back-up/Tape/Disk ..... ext. 216
Cabinets/Racks/Furniture ..... ext. 220
Desktop PC's ..... ext. 201
Kiosks ..... ext. 217
Laptops/Notebooks ..... ext. 203
Mainframes ..... ext. 215
Midrange ..... ext. 219
Monitors ..... ext. 212
Presentation
Project/Panels ..... ext. 205
Printers ..... ext. 204
Repair & Maintenance ..... ext. 221
Security ..... ext. 218
Servers ..... ext. 214
Storage/RAID/DAT/Optical ..... ext. 209
Terminals ..... ext. 211
Workstations ..... ext. 203

Networking/Communications
Client/Server Tools ..... ext. 603
Diagnostic/Testing Equipment ..... ext. 629
Groupware ..... ext. 606
Internet Products/Services ..... ext. 634
Network Hardware ..... ext. 619
Network Management ..... ext. 607
Network Software ..... ext. 618
Remote Access ..... ext. 633
Security ..... ext. 632
Storage/Cabinets/LAN Racks ..... ext. 615
TCP/IP ..... ext. 626
Windows NT ..... ext. 617

Services
Consulting/Contract
Programming ..... ext. 703
Conventions ..... ext. 707
Data Recovery ..... ext. 708
Outsourcing/Remote
Computing ..... ext. 706
Training/Software Support ..... ext. 704

Internet/Intranet
Application Development
Tools ..... ext. 220
Browsers ..... ext. 305
Consulting ..... ext. 308
Security ext.322

PLACE

Premier Solutions

Beacon™ 2500



$6,499

500 Lumens!

The new standard for brightness and value in conference room LCD projectors!

- True 500 ANSI Lumens!
- Auditorium or full room light use!
- Remote power Zoom & Focus
- 2 PC inputs, 2 video, 4 audio

"Boxlight sells more electronic projection systems, to more people than anyone. Call to find out why."

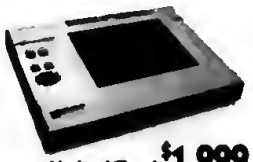
ColorShow™ 2000+



ONLY $3,999

The first, and still the only TFT active-matrix projector you can buy for under $4,000!

- Sleek, compact & stylish design
- Less than 20 lbs. travel weight
- Includes free remote control



Limited Time! $1,999

ProColor™ 1301

TFT Active Matrix Color for under $2,000

- Save $1,000 on our Best Seller!
- Lightweight, reliable, rugged design
- Mac or PC, optional video & audio
- Easy-menu, zoom, freeze, pointer

As the most trusted name in Presentation Electronics™, we offer:

- Dialog with knowledgeable people who really help
- More than 50 models to choose from, available now
- Overnight shipping to multiple world-wide locations
- Money-back 30-day guarantee
- Free lifetime tech support

Monday through Friday, 6am — 5pm, Pacific Time. Purchase orders accepted (some restrictions). Prices subject to change. Quantities may be limited to stock on hand.

#1 For Rentals

Call BOXLIGHT today 1-800-762-5757

Government: (800) 497-4009
Resellers: (800) 736-6956
International: (360) 779-7901

Rental: (800) 736-6954
Fax: (360) 779-3299
Education: (800) 689-6676

BOXLIGHT™ DIRECT

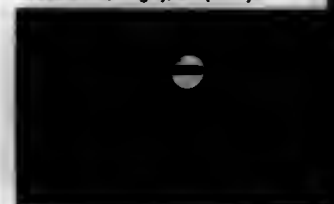
http://www.boxlight.com

Introducing SecureLAN™ from Cylink. The cost benefit of public switched networks combined with network security confidence.

Cylink, the industry leader for low cost network security over the internet, introduces SecureLAN, a family of products that keeps your network safe from intruders.

Certifiably secure.

SecureLAN uses hacker-proof digital certificate technology. In one system you get a complete set of security features including access control, authentication, integrity, and privacy.



SecureLAN family of products provide network security over low cost public switched networks.

SecureLAN is based on industry standards which meet or exceed next generation security standards: digital certificates, digital signatures, public-key cryptography, and Diffie-Hellman key management.

The SecureLAN family of products easily integrates into your existing network. SecureLAN provides security at the application level, between end nodes, domains, and sub-networks, providing a comprehensive security solution for your entire enterprise network.

So, put the Cylink Super Cop on your Super Highway. Call 1 800.533.3958 (US) or 408.735 5800, (outside the US). We will send you the information you need to keep your network safe.

CYLINK

910 Hermosa Court, Sunnyvale, CA 94086,
USA Tel: 408 735.5800 Fax: 408.720.8294
http://www.cylink.com/

© 1996 Cylink Corporation. SecureLAN is a trademark of Cylink Corporation.
Other trademarks or registered trademarks are the property of their owners. E-mail: info@cylink.com
Fax on Demand: USA 800.735 6614 Int'l. 408.735 6614

SUPER COP ON [illegible] SUPER HIGHWAY

PLACE

IF YOU

THINK YO

HAVE ENOU

BACKUP FOR

YOUR OS 2 WARP

DESKTOP OR SERVER

THINK AGAIN

Premier Solutions

Desktop to enterprise, Seagate Software delivers the standard in OS/2 data protection. Seagate Sytos Premium for OS/2 servers and Seagate Backup for OS/2 Warp desktops give you error free restore operations via disk to tape comparison. Point-and-Click simplicity and powerful schedulers let you manage backups effortlessly. The widest range of device support protects your current investment in tape hardware as well as covering devices you may add in the future. For more information on the industry's *number one* OS/2 Warp data protection solutions call 1-800-327-2232 domestically, 407-333-7501 internationally, or find us on the Web at http://www.sssmg.seagate.com

To Order Today...
Call Indelible Blue At 1-800-776-8284.

Seagate Software

Seagate Software • 37 Skyline Drive • Lake Mary, FL 32746

Kabit Security

STOP COMPUTER TH

IN THE OFFICE — ON THE RO

- ***Secure computer or notebook to desk, table, etc.***
- ***Protect data***
- ***Lifetime warranty***



Quick And Easy To Install!
Compact — Lightweight!
Available For Macintosh Computers Too!

Order Now — Call 800-451-7592

Secure-It

18 Maple Court, East Longmeadow, MA 01028, USA 413-525-7039

COMPUTER RACKS



Call 1-800-434-3746

REMOTE

COMPUTING

Extensive Software Library
Advantis Compuserve Tymnet Internet and WWW Services
Year 2000 Conversion/Testing Platform
Extraordinary Customer Service
Complete Migration Management
info@faneuil.net

MVS/ESA IMS/DBDC
VM/ESA CICS SAS
VSE/ESA TSO DB2

708-574-3636
615 Commerce Drive, Oak Brook, IL 60521

FANEUIL SYSTEMS

PLACE

Hardware • Buy / Sell / Lease
Services • Classified Solutions

ALICOMP/CBS
A Unique Outsourcing Services Provider

OUTSOURCING • REMOTE COMPUTING

TRANSITIONAL AND LONG TERM CUSTOM SOLUTIONS
VM • MVS • VSE 105,000 sq.ft. SECAUCUS, NJ COMPLEX

"OUR PLATFORM IS CUSTOMER SATISFACTION"

800 274-5556 • 201 319-8787

GET HELP!

Mainframe • AS/400 • Client/Server

- Data Center Facilities
- Remote Support
- Networking
- Desktop
- Technical Assistance
- Internet

Amquest, Inc.
470 East Paces Ferry Road
Atlanta, GA 30305

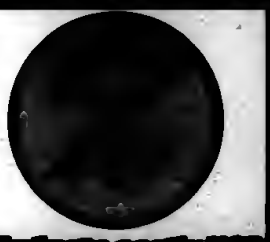
YOUR PARTNER IN MANAGING INFORMATION TECHNOLOGY

IBM
- ES/9000
- SERIES 1
- AS/400
- RS/6000
- SYSTEM/88
- ...and more!

New & Used
• Comput...
• Periph...
• Upgrad...
B... S... Rent Lease

(714) 970-7000 (714)...
Anaheim Corporate Center
5101 E. La Palma Ave., Suite/Floor
Anaheim, CA 92807

amdahl
Cisco
Concurrent
Data General
DEC
HEWLETT PACKARD
Stratus
Sun
TANDEM
UNISYS
XEROX



...with ESCON 2000
direct channel-attached multi-protocol converter/controller.
1-800-554-9372
http://www.jdem.com

GETTING PRODUCT INFORMATION JUST GOT EASIER!

All you need is your phone, and your issue of Computerworld. Turn to the Computerworld Marketplace Vendor Center at the beginning of this section and dial 800-477-0018.

IT'S FREE AND EASY TO USE!

We offer:
- Full Conversion Strategy
- Assessment/Planning
- Supervision/Conversion/Testing
- Flat fee, low rates
- Off Site Development
- Automated Tools, Human Resources
- Specialized COBOL Technicians
- Previous Experience Year 2000 Conversions

You take care of your business, we'll take care of the conversion! Don't wait until 1999. Call us now for a FREE plan.

ISC Corp. Rye, New York (800) 998-1336

DOUBLE Your Purchase Power!

We sell and lease refurbished
STRATUS
WYSE
TELEVIDEO
DEC
IBM
at HALF the price of new

800-410-6161

Computer Hardware Resources, Inc.
www.chrhq.com

PC DIAGNOSTICS
OmniPost Analyzer
The only 3 in 1 tool:

1. IRQ and DMA conflict detection
2. Self-booting Diagnostics
3. Enhanced Power-On-Self-Test

- Works on Win95, Novell, DOS, Unix, OS/2
- Tests XT, AT, ISA, EISA, VESA, PCI, PS/2 25 and 30
- 8- and 16-bit Hardware analyser.

Call for FREE Diagnostic Software.

TriniTech, Inc.
1-800-909-3424

Advertiser	Address
Alicomp/CBS	(800) 274-5556
Amquest	http://www.amquest.com
Bonlight Direct	http://www.bonlight.com
Computer Hardware Resources Inc.	http://www.chrhq.com
Cybik Corp.	http://www.cybik.com/
Fenwell	http://www.fenwell.net
Hango	(800) 434-3746
IBC	(800) 290-1336
JDS Microprocessing	http://www.jdsm.com
Seagate Enterprise	http://www.seag.seagate.com
Secure-It	http://web.pm/secure-it/index.html
Systemi	(800) 745-1233
Trintech	(800) 909-3434

This index is provided as an additional service.
The publisher does not assume any liability for errors or omissions.

Is Your Company Listed in the Computerworld Internet Resource Directory?

If not, no need to worry! *COMING IN SEPTEMBER* - an all new, updated version of the Computerworld Internet Resource Directory. Call today for your fall 1996 Internet Resource Directory Packet! Deadline: July 26, 1996

COMPUTERWORLD MARKETPLACE ADVERTISING SALES

HEADQUARTERS:
Computerworld Marketplace
500 Old Connecticut Path
Framingham, MA 01701
800/343-6474
Fax: 508/820-8141

MARKETPLACE SALES MANAGER
Michelle Reeves, ext. 8197
Internet: michelle_reeves@cw.com

NORTHEAST/EASTERN CANADA
Laurie Gomes, ext. 7759
Internet: laurie_gomes@cw.com

CENTRAL & SOUTHEAST
Ann Maloney, ext. 7744
Internet: ann_maloney@cw.com

WEST/WESTERN CANADA
Claude Garberino, ext. 6313
Internet: claude_garberino@cw.com

WESTERN SALES OFFICE
Computerworld Marketplace
500 Airport Blvd., Suite 400
Burlingame, CA 94010
415/548-5544
Fax: 415/343-5023

Find the Computerworld Internet Resource Directory On-line at www.computerworld.com/techcity

Computerworld, Inc.

CEO/President Gary J. Beach
Executive Vice President Steven F. West
Senior Vice President/Finance Matthew C. Smith
Vice President/Human Resources Susan C. Perry
Executive Assistant to the CEO/President Karen E. Elliott

Computerworld

An IDG Company: The World's Leader in Information Services on Information Technology

Publisher
Kevin McPherson

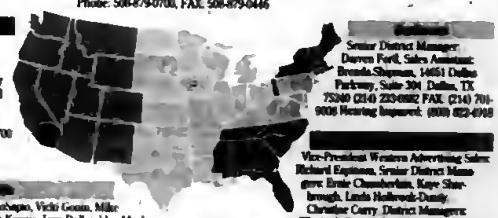
Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 508-879-0700, FAX: 508-875-4394

Editor Paul Gillin
Vice-President Sales/Associate Publisher David Peterson
Vice-President Marketing Bob Winter
Vice-President Consumer Marketing Gail Odenwald

PUBLISHER'S OFFICE: *Assistant to the Publisher/*Lou Berman **MARKETING:** *Director, Marketing Communications/*Mary Doyle, *Senior Manager, Marketing Communications/*Elizabeth Phillips, *Manager, Trade Show & Conventions/*Audrey Abbott, *Marketing Manager/*Susan Thaxter, *Marketing Communications Project Manager/*Karen Liebo, *Marketing Specialist/*Emily Dameron, *Administrative Assistant/*Patty White **CIRCULATION:** *Director of Circulation Management/*Maureen Burbe **PRODUCTION:** *Production Director/*Christopher P. Cuoco, *Production Manager/*Beverly Wolff **SALES CLASSIFIED:** *Classified Operations Director/*Cynthia Delany **DISTRIBUTION:** *Distribution Manager/*Bob Wescott, *Traffic Manager/*Pat Walker **INFORMATION SYSTEMS:** *Vice-President of IS/*Walter Crosby

Sales Offices

Associate Publisher/Vice-President/Sales
David Peterson
Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171 Framingham, MA 01701-9171
Phone: 508-879-0700, FAX: 508-879-0446



Regional Vice President: Sherry Driscoll, Senior District Managers: Bill Cadigan, John Watts, Sales Office Coordinator: Tammy Bennett, Sales Assistants: Cheryl Stratton, Barbara Shuman, 470 Totten Pond Rd., 5th Floor, Waltham, MA 02154 (508) 879-0700 FAX: (617) 890-2689 Hearing Impaired: (800) 428-8244

Senior District Managers: Fred Labagnio, Vicki Gonin, Mike Buchman, Sales Assistants: Susan Kunzic, Jean Dellarobba, Mack Center 1, 305 West Passaic St., Rochelle Park, NJ 07662 (201) 587 0090 FAX: (201) 712-9786 Hearing Impaired: (800) 208-0288

Regional Vice President: Bernie Hockenweder, Sales Assistant: Jennifer Pattenaude, 1565 Woodington Circle, Suite 201, Lawrenceville, GA 30244 (770) 931-8104 FAX: (770) 931-8106 Hearing Impaired: (800) 449-4974, Senior District Manager: Mike Buchman, Sales Assistant: Mary Cavaliere, 175 Strafford Ave., #1, Wayne, PA 19087, (610) 975-4581 FAX: (610) 975-4582

Senior District Manager: Sharon R. O'Brien, Sales Assistant: Denice Richards, 980 N. Michigan Avenue, Suite 1400, Chicago, IL 60611 (312) 214-3916 FAX: (312) 214-4962

Boston: Vice President/Larry Crowen, Director of Publishing Services/Carolyn Medeiros, Project Coordinator/Heidi Bradley, Managing Editor/Peter Buchsar, Graphic Designer/Gail Varney, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 875-8931

San Francisco: West Coast Director/Elaine R. Offenbach, Sales Associate/Nikki Wilson, 530 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-0812

Associate Publisher: James Finney, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 872-2284 **East:** Don Calamaro, 1856 Windsor Park Lane, Havertown, PA 19083 (610) 446-5372 FAX: (800) 446-5752

West: Sharon Chin, 530 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-0812

Sales Manager/Michelle Berven, Northeast Account Executive/Laurie Gomes, Central/Southeast Account Executive/Ann Mehoney 500 Old Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474 FAX: (508) 820-8041
Western Account Executive/Claude Corbeanu, 530 Airport Blvd., Suite 400, Burlingame, CA 94010 (415) 548-5544 FAX: (415) 343-5813

Vice President/General Manager: Richard Mihlits, Vice President: John Carpenter

Computerworld VAR Database: Carol Mullen/ National Sales Manager: Account Executive/Sean Weglage, (508) 879-0700 FAX (508) 879-0184

Computerworld Buyers Database East: Regional Manager, Database Services/Linda Clutton, (508) 879-0700 FAX: (508) 879-0184

Computerworld Lead Management: Eastern Regional Manager/Phil Lampert, Central Regional Manager/Tim Hinds, (508) 879-0700 FAX (508) 820-0547, Western Regional Manager/Gena Haas, (415) 347-0555 FAX (415) 347-0812

Chairman of the Board, Patrick J. McGovern; **President,** Kelly Conlin; **Chief Operating Officer,** Jim Casella; **Vice President Finance,** Gene Garton

Computerworld is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 200 computer publications in 63 countries. Forty million people read one or more International Data Group publications each month.

Advertisers Index

Anixter 64
http://www.anixter.com
Apple 21
AST Computer 72
http://www.ast.com
Cabletron 89
http://www.cabletron.com
Centura Software Corp. (formerly Gupta) 92
http://www.gupta.com
Cisco 34-35
http://www.cisco.com
Compaq Computer Corp. 51, 53, 55, 57, 59
http://www.compaq.com
Computer Associates 5
http://www.cai.com
Compuware 25
http://www.compuware.com
Digital Consulting 71
Digital Equipment Corp. 62-63, 96-97
http://www.digital.com
Exabyte 100
Forté 15
http://www.forte.com
Hewlett-Packard 38
http://www.hp.com
Hitachi 74-75, 77
IBM 66-67, 90-91, C3
http://www.ibm.com
IBM 80
http://www.raleigh.ibm.com/netad.html
Informix Software 69
http://www.informix.com
JD Edwards 46
Leadership Series 32/33
Lotus Development Corp. 26-27, 44-45
http://www.lotus.com
(800) 343-5414
McAfee 128
http://www.mcafee.com
Meeting & Murder 15
Micro Focus 11
http://www.microfocus.com
(800) 872-6265
Micron 61-63
Microsoft 10-11, 48-49, 78-79, 130
http://www.microsoft.com
Motorola 43
http://www.motorola.com
NCR 30-31
http://www.ncr.com
NetManage 126
http://www.netmanage.com
Netscape 124
http://www.netscape.com
Oracle Corp. 7, 9
http://www.oracle.com
Powersoft C4
http://www.powersoft.com
Ross Systems 10
SAS Institute 17, 22-23
http://www.sas.com
Share Technology Conference 20
Sprint 87
Sun Microsystems 28, 103
http://www.sun.com
Symbios Logic 40-41
Syncsort 3
http://www.syncsort.com
UB Networks 70
US Robotics 82-83
WRQ 60, 61
http://www.wrq.com
Workstation Group 52
http://www.wrkgrp.com

To have your Internet address listed here, please contact Paula Wright at (508) 820-7716
This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Receive Premium With Your Computerworld Subscription

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:
COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.
Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription
All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line.

Your New Address Goes Here Address shown: ❑ Home ❑ Business

Name
Company
Address
City State Zip

Other Questions and Problems
It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: 1-800-669-1002 Outside U.S. call (614) 382-3322. CompuServe members can reach us at account number 73373, 1230. Internet address: circulation@cw.com

COMPUTERWORLD allows advertisers and other companies to use its mailing list for selected offers we feel would be of interest to you. We screen these offers carefully. If you do not want to remain on the promotion list please write to the following address – COMPUTERWORLD, Circulation Department, 500 Old Connecticut Path, Framingham, MA 01701.

Name / Title / Company / Address / Zip

FRUSTRATED ABOUT HOW TO IMPLEMENT AN INTRANET?

PUNCH SOMETHING.



1-800-409-6224



Call for your free Forrester Reports: The Full Service Intranet and Which Web Server?

Trying to find accurate information in the midst of all the intranet hype is a challenge. Relax. You'll feel a lot better when you get the facts from the industry experts. Call for your free Forrester Reports on intranets and Web server software. Both analysts and the trade press agree, if you're building an intranet, you need to consult Netscape.

> *Forrester defines Full Service Intranet as: standardized e-mail, directory, file print, and network management. Netscape gets it. And with SuiteSpot it has begun to deliver on the vision.*
>
> –The Forrester Report
> The Full Service Intranet, March, 1996

And *PC WEEK* said:

> *For corporations planning to use intranet-based technologies for internal use, [Netscape] SuiteSpot is shaping up as a better alternative...*
>
> –*PC WEEK*, May 13, 1996

IS professionals have not only chosen Netscape Navigator for their intranet, they're choosing the full range of Netscape's software solutions. In fact, when Forrester polled professionally managed Web sites, 80% indicated they had chosen Netscape.

So call, or visit our Intranet Solutions site at home.netscape.com to find out for yourself. And breathe a sigh of relief.

N

NETSCAPE

© 1996 Netscape Communications Corporation. All other trademarks are property of their respective owners. Forrester's research is independently produced and not commissioned by or custom developed for individual companies.

Is the zing out of Xilinx? 127

Next week: Go online with discount brokerages

the

virtual exchange

Who needs Wall Street? Some contend that the Internet will become the place to trade

By Melissa Bane



Imagine sitting at your computer, looking up the current share price of a small start-up in Silicon Valley and ordering 100 shares. An electronic trading system zips the money directly from your online bank account straight to the company. No call to the broker, and, more important, no cut to the broker. That's the dream of a handful of oew companies trying to make the Internet the next stock exchange.

The companies differ in their approaches. PerfectData Corp. in Simi Valley, Calif., simply wants to match buyers and sellers over its electronic bulletin board system, PerfectTrade. The trades themselves, however, would take place over the traditional stock exchanges.

Direct IPO Corp. in Marina Del Rey, Calif., wants to help small Internet-related companies offer stock directly to investors via the World Wide Web. Similarly, Wit Capital Corp. in New York hopes to create a system where multiple companies' stocks are traded directly on the 'net.

"We certainly believe the Internet can be the next major trading system," says Andrew Klein, founder of Wit Capital and formerly a securities lawyer. "There's an doubt [that] the technology exists."

Klein set off the race toward online trading in March, when he took his first company, New York-based Spring Street Brewing Co., public on the Web. Klein's innovative plan to cut out the middleman in securities trading set off alarms on Wall Street and at the Securities and Exchange Commission (SEC).

The SEC initially asked Klein to pull down the trading service he created to sell shares of Spring Street Brewing, called Wit-Trade. But after review, the SEC gave Klein the OK to resume operation.

He decided to take his idea to other companies looking to go public on the Internet, founding Wit Capital. Klein says he intends to help small companies raise small amounts of capital. By qualifying as a broker and becoming an equity partner with an investment bank, which has yet to be named, he hopes to offer online trades for free, undercutting traditional, and even discount, brokers. His revenue will come from taking approximately 3% of the shares offered at initial public offerings (IPO), which is significantly less than the 6% average that most investment banks take.

The move has spooked Wall Street, mainly because these trading systems threaten to cut out brokers and commissions entirely. Although several discount brokerages offer online trading at reduced fees, they still charge something. Charles Schwab & Co. (www.eschwab.com/), for example, offers electronic trading for a quarterly fee of $7.50, with a $39 commission for trades up to 1,000 shares and 3 cents extra for each share over 1,000. In contrast, Schwab takes a 10% cut of a traditional trade's overall value.

"I think people are very hostile today toward brokers for a good reason," Klein says. And that reason is brokers have a basic conflict of interest: They offer investment advice but are paid only when their client buys securities. "We aim to remove that problem," he says.

Although the move toward trading on the 'net threatens brokers' traditional price structures, investors will always need some of the services that brokers provide, says Michael Anderson, president and chief operating officer at Accutrade, a discount brokerage that offers online trading.

"If I go directly on the Web, who bears the risk?" he asks. Brokers will be needed to finance margin debts, validate and verify stock certificates, maintain accounting records and send out statements, he explains.

Brokers further argue that setups such as Klein's pose too much of a security risk, not to mention difficult regulation obstacles, due to the open nature of the Internet.

"Somebody's got to guarantee that there's a free and equal flow of information with an online system," says Bert Hochfeld, vice president of Josephthal Lyon & Ross, a financial analysis firm in New York. "Otherwise, you get some investors with an advantage over others and possible insider trading."

Nasdaq spokesman Marc Beauchamp agrees that the Internet poses security concerns regarding fraud, account clearance and overall regulation. He sees the 'net becoming a launching pad for small, illiquid firms that can't afford an IPO on one of the major exchanges rather than a full online trading forum.

Klein argues that with support from the SEC, the Internet could become the perfect trading forum.

"Our goal is to be the biggest and the best," Klein says. "By cutting out the middleman, the Internet is going to completely alter the way markets work."

Pioneering exchanges

Direct IPO Corp.
Location: Marina Del Rey, Calif.
Launched: May 1996
Phone: (310) 821-3639
URL: www.directipo.com

PerfectData Corp.
Location: Simi Valley, Calif.
Launched: August 1994
Phone: (310) 358-2340
URL: www.perfectdata.com

Wit Capital Corp.
Location: New York
Launched: April 1996
Phone: (212) 228-5787
URL: www.witcap.com

Are we missing something?

Would you like to see more stories on online investing? On how to invest in hot technology areas? Let us know what you'd like to see on this page. Send E-mail to tam_harbert@cw.com or call 508-879-0700, ext. 8147.



Clearly The Leading IntraNet Desktop.

Introducing Chameleon IntraNet Desktop™ with Windows 95 and NT. The world's most complete IntraNet desktop suite.

Now any desktop PC on your IntraNet can access information anywhere—including the Internet. Chameleon IntraNet Desktop includes six integrated program groups, making it the best value you can buy—and it's available with NFS—the file system of the IntraNet.

Chameleon is based on the standards that built the Internet, so your investment is fully protected in the years to come. Chameleon IntraNet Desktop is part of the NetManage IntraNet Family—a comprehensive suite of products designed to help you build a powerful corporate IntraNet. Call now and GO! IntraNet today.



- NFS client and server for Windows 95, NT and 3.1.
- Six highly integrated product groups: **Host Access, E-Mail and Messaging, Internet Access, Group Collaboration, File and Printer Sharing,** and **Desktop Management.**
- Access any server
- Setup in 5 minutes.

FREE!

1-408-342-7525

NETMANAGE®
WE KNOW THE NET. INSIDE AND OUT.

sales.c@netmanage.com
www.netmanage.com

© 1996 NetManage Inc., 10725 North De Anza Blvd., Cupertino, CA 95014 U.S.A. Fax. (408) 257-6405 UK. +44 1483 881800; Israel: +972 (0)4-8550234; Germany +49 (0) 8165/9470-0; France: +33-1-47 72 08 08; Japan: +81 (0) 3-3221-8400. Specifications are subject to change without notice. All trademarks are property of their respective companies. Chameleon, GO! IntraNet and NetManage are trademarks or registered trademarks of NetManage Inc.

The Week in Stocks

Gainers

PERCENT

Intelligent Info. Systems	122.2
Network Computing Devices	36.0
Storage Technology(H)	30.6
Micron Info. Systems	28.3
Shiva Corp.(H)	26.4
PSINet	25.0
Apple Corp.(H)	23.7
Datum Corp.	18.8

DOLLAR

Shiva Corp.(H)	10.00
Storage Technology(H)	7.88
Spectrum Corp.(H)	5.38
MCI America	5.25
McAfee Associates(H)	5.25
Compuware Corp.(H)	5.00
Microsoft Corp.(H)	4.63
Netscape Comm. Corp.	4.63

Losers

PERCENT

Unisys(L)	-28.6
Quantum Corp.	-18.9
Quarterdeck Corp.	-17.5
Adaptec Corp.	-17.0
IPL Systems Inc.	-15.0
Xircom	-14.8
Macromedia Inc.	-14.3
Parlex	-13.3

DOLLAR

Boeing Company	-9.13
Xylan Corp.	-8.25
Seagate Technology	-7.25
US Robotics	-7.00
Sybase Inc.	-6.88
Planar Corp.	-6.00

Industry Almanac

The logical move?

One of the few steadily strong areas in the volatile semiconductor sector has been the market for programmable logic devices (PLD), which are chips that can be customized to perform specific functions. PLD leader, **Xilinx, Inc. (Nasdaq:XLNX)**, has been a favorite among many financial analysts.

But at least one analyst says a looming price war may take some of the zing out of Xilinx.

With revenue of $520 million last year, Xilinx is the largest supplier in the booming PLD market, which amounted to $1.7 billion last year and is growing at 30% a year, says Brett Hodess, managing director at Montgomery Securities in San Francisco. Hodess gives the stock a buy recommendation. He says it could appreciate 30% during the next year and reach $43.

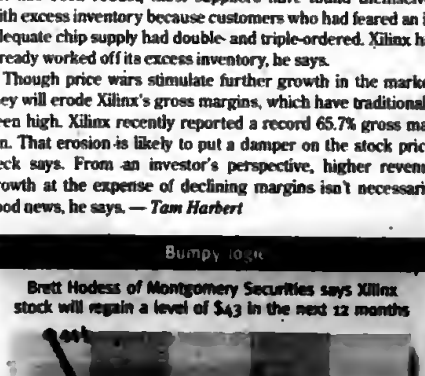
But Drew Peck, a semiconductor analyst at Cowen & Co. in Boston, recently downgraded the stock to neutral after he was bullish on it for years.

Peck says his concern is a possible price war. Xilinx's main competitor, **Altera Corp. (Nasdaq:ALTR)**, is sitting on a lot of inventory and may start cutting prices. Although the PLD market has been robust, most suppliers have found themselves with excess inventory because customers who had feared an inadequate chip supply had double- and triple-ordered. Xilinx has already worked off its excess inventory, he says.

Though price wars stimulate further growth in the market, they will erode Xilinx's gross margins, which have traditionally been high. Xilinx recently reported a record 65.7% gross margin. That erosion is likely to put a damper on the stock price, Peck says. From an investor's perspective, higher revenue growth at the expense of declining margins isn't necessarily good news, he says. — *Tam Harbert*

Bumpy logic

Brett Hodess of Montgomery Securities says Xilinx stock will regain a level of $43 in the next 12 months



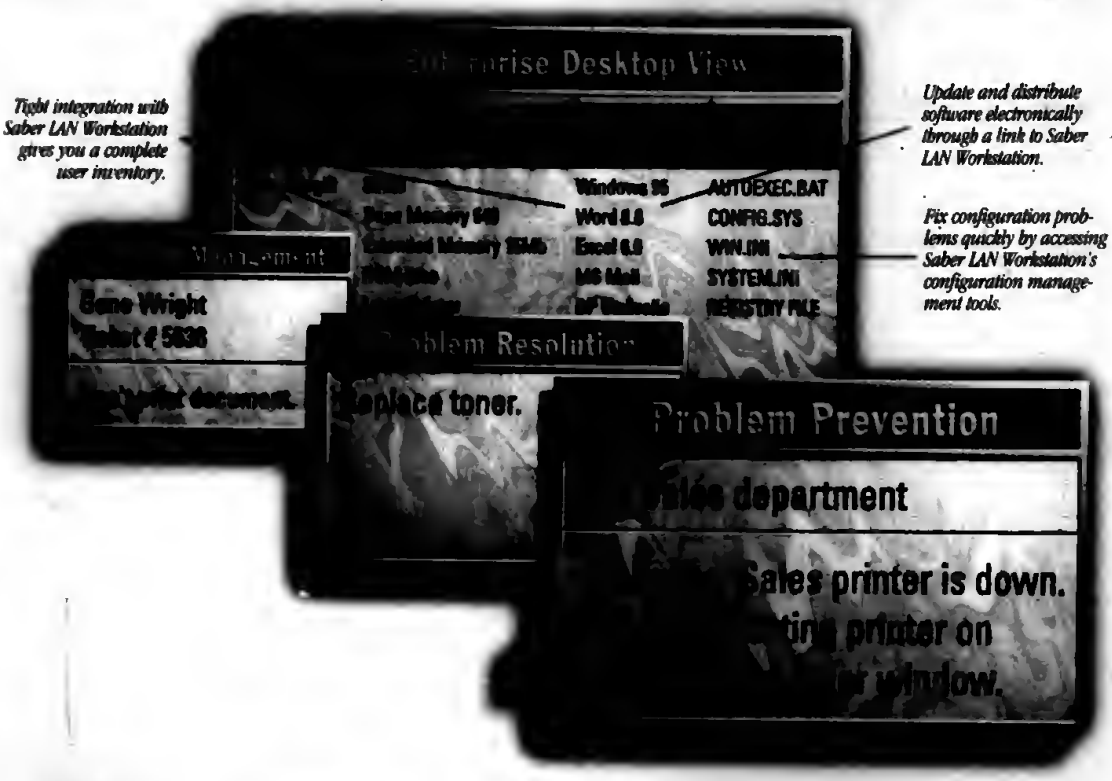
Exch	52-Week Range			June 14 Wk Net 5 PM	Wk Pct Change
COMS	41 1/2	30 1/2	3 COM Corp	47.00	-0.63 -1.3
AIT	66.88	47.25	AMERITECH Corp.	53.00	1.00 1.9
AXE	22.13	15.63	Anixter Intl.	16.50	-0.63 -3.6
APTS	12.13	9.75	Apertus Tech.	3.81	-0.00 -1.6
T	68.88	50.50	AT & T	67.25	1.25 2.0
ASND	71.25	30.88	Ascend Communications	50.25	3.44 4.6
BNYN	14.25	6.00	Banyan Systems Inc	9.13	1.93 -15.1
BAY	30.00	25.38	Bay Networks Inc.	27.38	0.25 0.9
BEL	60.38	43.50	Bell Atlantic Corp.	61.13	-1.38 -2.2
BLS	45.00	30.25	BellSouth Corp	38.88	-1.00 -2.5
BRKT	40.00	9.13	Brooktrout Technology	30.50	-0.75 14.9
CS	87.25	68.63	Cabletron Systems	67.00	0.11 0.2
CSCC	67.50	11.25	Cascade Communications (H)	67.00	1.25 -1.5
CGRN	25.13	13.00	Centigram Communications	30.38	0.13 0.8
CSCO	57.88	23.00	Cisco Systems Inc.	33.25	-0.50 -0.6
CLIX	11.50	6.50	Compression Labs Inc.	6.50	-1.13 -14.8
CMNT	12.75	4.00	Computer Network Tech.	8.13	0.13 1.6
XCOM	14.38	8.75	CrossComm	10.50	-0.25 -2.3
DIGI	54.00	25.88	DSC Communications	50.81	1.94 3.6
FORE	64.75	12.88	FORE Systems Inc.	54.25	2.00 -5.5
GDC	21.88	50.00	General Datacomm Inds.	16.88	0.38 3.3
GSX	67.38	38.00	General Signal Networks	38.00	-0.63 -1.6
GTE	49.25	37.75	GTE Corp	42.38	-0.75 -0.6
LU	88.25	38.38	Lucent Tech.	57.50	-0.75 -0.7
MCIC	21.13	19.50	MCI Communications Corp.	27.75	-0.38 -1.3
MCIM	34.38	3.50	MCI OM Communications Corp	11.88	0.13 1.1
MNPI	34.50	12.63	Microcom Inc.	13.63	-4.38 -24.3
NETM	54.00	9.38	NetManage Inc.	24.50	-1.75 -10.8
NTRX	13.38	3.63	Netrix Corp. (H)	10.38	3.25 13.7
NCDI	12.00	2.88	Network Computing Devices	5.88	1.38 30.6
NWK	67.00	21.00	Network Equipment Tech.	36.38	-1.63 -4.6
NETG	27.63	11.50	Network General (H)	24.50	0.13 0.5
NW	76.25	75.00	Newbridge Networks Corp.	67.88	-4.13 -6.2
NT	55.38	31.50	Northern Telecom Ltd. (H)	37.38	-1.38 -2.6
NOVL	31.63	11.38	Novell Inc.	13.81	-0.31 -2.2
NYN	50.25	50.25	Nynex Corp	46.13	-0.38 -0.8
OCTL	26.25	12.63	Octel Communications Corp	24.25	0.25 1.6
ODSI	45.25	17.00	Optical Data Systems Inc	26.00	-0.38 -2.8
PAC	31.25	25.63	Pacific Telesis	33.38	0.00 0.0
PCTL	66.72	50.75	Picturetel Corp.	56.88	-5.25 -9.7
PTCN	10.75	6.75	Proteon Inc.	9.50	-0.25 -4.3
RACD	7.88	3.88	Racotek Inc.	9.25	0.13 1.4
RETK	30.88	1.81	3Com	7.00	-2.13 -73.3
SBC	50.25	45.25	SBC Communications	49.25	-0.25 -0.5
SFA	23.38	11.38	Scientific Atlanta Inc.	16.25	-1.75 -9.7
SHVA	84.25	19.13	Shiva Corp. (H)	84.25	12.00 16.6
FON	45.38	29.25	Sprint Corp	40.38	2.38 6.6
SMSC	75.50	14.38	Standard Microsystems Corp	30.88	0.13 0.7
STRM	57.50	50.50	Stratacom Inc.	54.50	-0.75 -1.4
TDY	11.88	2.50	Telxon Corp. (H)	12.00	-0.75 -5.9
USRX	105.38	34.25	US Robotics	88.44	-7.06 -7.4
USWC	48.38	38.38	US West Inc.	31.50	-1.50 -4.2
XIRC	17.38	8.88	Xircom	11.75	1.50 14.8
XYLN	76.00	50.50	Xylan Corp	48.50	-8.25 -14.1
AALR	10.38	5.75	Advanced Logic Research	9.13	-0.75 -7.7
AAPL	50.13	23.00	Apple Computer Inc.	24.13	-0.25 -1.0
ASTA	18.50	4.63	AST Research Inc.	7.63	0.38 5.2
CPQ	56.75	30.88	Compaq Computer Corp	47.00	1.38 3.0
DELL	37.25	23.00	Dell Computer Corp	31.38	-1.60 -4.7
GATE	41.50	18.00	Gateway 2000 Inc. (H)	39.00	-0.63 -1.6
HWP	115.38	68.38	Hewlett Packard Co.	89.00	-4.25 -4.6
IBUI	29.88	9.00	Micron International Inc.	14.00	-1.13 -7.6
MPNY	75.13	31.00	3D Computer	57.13	5.25 8.0
SGI	45.63	21.13	Silicon Graphics	25.63	0.13 0.5
SUNW	67.13	19.25	Sun Microsystems Inc. (H)	57.50	5.75 -9.1
AMH	13.38	6.75	Amdahl Corp	11.13	-0.38 -3.3
DGN	50.13	8.13	Data General Corp.	13.13	0.13 1.0
DEC	76.38	35.13	Digital Equipment Corp.	46.50	0.38 0.8
IBM	130.88	80.13	IBM	109.00	1.63 1.6
MDCD	30.25	3.38	Meridian Data Inc.	15.13	1.63 -9.7
NETF	7.50	3.88	NetFrame	3.38	0.13 2.4
SQNT	23.38	-30.13	Sequent Computer Sys.	13.50	0.25 1.9
SEQS	19.00	2.88	Sequoia Systems Inc.	3.50	-0.13 -1.6
SSA	41.50	13.00	Stratus Computer Inc.	31.50	0.63 2.0
TDM	17.50	8.38	Tandem Computers Inc.	11.13	-1.25 -10.1
TBCD	7.50	2.00	TriCord Systems (H)	5.75	-1.38 -20.7
UIS	11.50	5.50	Unisys Corp	7.50	-0.38 -4.8
ADBE	74.25	30.00	Adobe Systems Inc.	35.38	0.38 1.1
AMSWA	8.75	3.63	American Software Inc.	5.00	-0.38 -7.0
APLX	42.38	8.75	Applix Inc	30.75	-1.75 -5.5
ARSW	82.75	30.75	Arbor Software	50.50	-1.75 -2.9
AUTD	53.00	27.25	Autodesk Inc.	37.50	-2.25 -6.5
BACH	13.00	4.63	Bachman Info. Systems	8.00	1.38 18.1
BGSS	50.00	29.75	BGS Systems Inc.	40.50	-0.50 -1.2
BMCS	67.25	32.50	BMC Software Inc	54.13	1.38 2.7
BOOL	24.75	19.25	Boole and Babbage	24.88	-0.13 -0.5
BORL	75.25	10.00	Borland Int'l Inc. (L)	30.91	-0.75 -2.6
BOBJY	33.38	15.38	Business Objects	32.75	-9.13 -21.6
CVE	27.88	24.13	Cadvance Software Inc.	27.25	-0.25 -1.2
COGNF	27.38	8.38	Cognos Inc.	22.25	-2.50 -10.1
CA	82.13	57.25	Computer Associates	67.75	-2.63 -3.7
CVN	15.50	5.13	Computervision Corp	11.13	0.13 1.1
CPWR	50.25	15.38	Compuware Corp (H)	40.25	3.00 8.1
CSEE	31.50	12.38	Cosmocare Inc.	17.75	-0.63 -2.2
COSFF	38.50	8.38	Cotel Corp.	12.13	-1.13 -8.5
DWTI	15.25	5.25	Database Technologies Inc.	6.75	0.00 0.0
FILE	67.00	33.50	Filenet Corp	43.00	-6.00 -12.2
DDDDF	8.25	3.56	4th Dimension	7.19	-0.19 -2.5
FTPS	40.63	8.13	FTP Software Inc	9.50	-0.88 -8.4
GSOP	26.00	7.00	Group 1 Software	9.25	1.00 9.8
GPTAE	30.50	3.25	Gupta	5.88	-0.63 -9.6
HUBB	50.88	17.00	Hummingbird Comm. Ltd.	50.50	-0.50 -2.8
HYSW	29.38	9.75	Hyperion Software Corp	13.25	-0.75 -8.6
IIIC	18.67	10.00	Information Resources	17.88	0.25 2.8
IFMX	36.75	16.88	Informix Corp	22.88	1.00 -6.2
INGR	50.13	30.88	Intergraph Corp.	31.63	1.88 11.6
LEAF	12.63	6.13	Interleaf Inc.	7.56	-0.38 -2.4
ISLI	26.25	8.75	Intersolv Inc.	10.13	1.75 31.0
INTU	88.25	33.50	Intuit Inc	33.75	3.50 0.0
LGWR	22.25	10.88	Logic Works	13.50	1.25 -8.5
MANS	32.75	10.00	Manugistics Corp	12.00	-4.50 -27.3
MATH	8.75	3.38	MathSoft	7.00	-0.13 -1.8
MCAF	50.75	17.50	McAfee Associates (H)	30.75	3.25 6.8
MENT	22.88	10.88	Mentor Graphics	17.13	0.00 0.0
MFGY	21.25	8.75	Micro Focus	12.63	-0.88 -6.5
MGRI	18.63	9.38	Microgrami Inc.	16.75	-0.38 -2.2
MSFT	125.38	29.88	Microsoft Corp (H)	123.25	1.63 2.2
ORCL	30.75	25.38	Oracle Corp	33.25	0.25 0.7
PARTC	49.38	23.13	Parametric Technology (H)	44.75	-1.88 -4.8
PARQ	14.63	9.63	ParcPlace Systems Inc.	11.63	0.75 0.0
PSFT	73.00	25.38	Peoplesoft (H)	71.25	2.00 2.9
PTEC	30.38	9.00	Phoenix Technologies	27.00	-2.63 -13.0
PSQL	16.88	9.13	Platinum Software	9.31	-1.44 -13.4
PLAT	26.00	11.25	Platinum Technology	16.00	-0.75 -4.5
PROG	38.00	16.63	Progress Software Corp	15.13	-0.63 -4.0
RMBO	26.75	30.00	Rambow Technos Oders Inc.	18.75	-1.25 -14.0
RIOD	63.00	29.50	Rio Disch Systems Inc.	30.00	0.00 0.0
ROSS	8.13	2.19	Ross Systems	6.00	-0.50 -7.7
SCOC	12.13	5.50	SCO Inc.	7.13	-0.62 -8.1
SOTI	109.50	17.63	Security Dynamics Tech. (H)	97.25	-3.00 -3.3
SILEY	51.75	11.38	Softkey International Inc.	25.38	-0.38 -1.5
SPCO	3.13	2.19	Software Publishing Corp	2.88	0.25 9.5
SQAI	39.75	16.00	SQA Inc.	33.00	-1.25 -3.6
SOTA	19.75	6.63	State of the Art (H)	50.63	-0.75 3.9
SSW	61.38	23.50	Sterling Software Inc.	28.38	1.13 1.5
SDRC	57.38	10.50	Structr. Dynamics Research	25.50	-0.50 -2.1
SYBS	39.25	21.25	Sybase Inc.	23.88	1.25 3.5
SYNC	35.25	9.88	Symantec Corp	13.50	-1.00 -6.9
SNPS	46.75	21.00	SynOpsys	41.25	-2.75 -6.3
SSAS	50.63	12.63	System Software Assoc.	17.50	1.38 8.5
SYSF	58.25	8.75	Systemsoft Corp. (H)	50.88	3.50 7.1
TRUV	10.13	4.38	Truevision Corp	7.25	-0.11 -1.7
VIEW	17.50	9.63	View Logic Systems	14.00	-0.88 -5.9
VMRK	21.50	5.75	Vmark Software Inc.	11.63	0.13 1.1
WALK	32.25	4.75	Walker Interactive Systems	11.00	-0.38 -3.3
WALL	23.75	13.00	Wall Data Inc.	22.75	0.75 3.4
WANG	36.13	13.00	Wang Laboratories Inc.	30.63	-1.06 -4.9
AMER	71.50	50.50	America On-Line	65.50	1.44 2.1
BBN	68.75	17.88	BBN Corp	33.88	-1.88 -8.1
CSRV	39.38	22.50	Compuserve Corp.	25.25	1.38 5.8
LCOS	29.75	13.63	Lycos Inc.	11.63	-3.11 -20.7
NETC	91.38	39.22	Netcom On-Line	54.25	1.88 3.8
NSCP	87.00	21.88	Netscape Comm. Corp	93.38	2.63 4.7
PSIX	39.00	8.75	PSINet	16.06	2.25 14.4
QDEX	38.50	8.88	Quarterdeck Corp.	9.88	-3.75 -27.5
RAPT	38.25	22.75	Raptor Systems	26.13	-3.75 -11.6
SCUR	64.50	38.50	Security Dynamics Corp	29.25	-4.50 -13.1
SPYG	91.00	13.25	Spyglass Inc.	75.63	-1.75 -4.9
UUNT	38.75	22.75	UUNET Tech.	44.00	2.00 3.7
YHOO	43.00	26.50	Yahoo! Inc.	35.25	-1.75 -4.7
AMD	39.25	16.13	Advanced Micro Devices	16.13	1.25 7.2
AIH	30.13	17.50	Analog Devices Inc.	26.88	-0.75 -0.9
CHPS	15.88	7.88	Chips and Technologies	10.00	-0.75 7.0
CRUS	91.13	17.00	Cirrus Logic	38.50	3.50 -7.5
CY	27.75	30.50	Cypress Semiconductor Corp	13.13	0.63 -4.9
CYRIX	49.75	18.75	Cyrix	36.25	-4.88 -35.7
INTC	98.38	49.81	Intel Corp	73.50	-1.75 -2.3
LSI	62.50	22.50	LSI Logic Corp.	27.50	1.38 4.8
LSCC	43.00	26.38	Lattice Semiconductor	35.00	0.75 2.2
MCRL	32.50	12.75	Micrel Semiconductor Inc.	15.00	-0.50 -3.2
MU	94.75	27.50	Micron Technology	38.00	-0.75 -2.6
MOT	82.38	44.75	Motorola Inc	66.38	-1.38 -2.1
NSM	33.63	13.50	National Semiconductor	15.50	-0.75 -3.6
TXN	83.75	42.75	Texas Instruments	67.13	0.63 -1.3
WLSI	39.13	10.75	WSI Technology	54.63	1.38 -8.6
WWTR	6.88	0.75	Wavtek (L)	0.88	0.00 30.0
WDC	29.50	14.38	Western Digital Corp	21.50	-0.63 -7.0
XLNX	55.50	23.75	Xilinx	33.31	0.19 0.6
ZLG	54.13	18.38	Zilog Inc.	30.50	-3.38 -10.0
APCC	25.50	7.88	American Power Conversion	11.44	-0.94 -7.6
ADPT	61.50	31.25	Adaptec Inc.	50.50	-2.75 -4.2
CBEX	13.13	5.00	Cabletron Corp.	6.13	-0.38 -5.8
CGIN	7.25	3.06	Chipcom Corp.	5.13	0.06 1.2
CREAF	14.13	5.75	Creative Technologies Inc.	6.75	-0.75 -3.6
RACE	12.88	3.63	Data Race Inc.	5.63	-0.63 -10.0
DTAR	9.38	4.13	Datatrak Corp.	6.63	0.25 12.8
EMC	27.38	13.00	EMC Corp	50.13	-2.25 -18.1
EMLX	28.50	4.50	Emulex Corp	17.25	1.25 -0.9
ESCC	29.00	14.25	Evans and Sutherland	27.25	1.00 -4.0
EXBT	22.25	10.00	Exabyte	16.38	1.88 -10.3
ISUF	4.25	1.50	Intelligent Info. Systems	2.25	0.75 37.5
IOMG	55.13	2.75	Iomega Corp	38.75	0.88 2.3
IPLS	8.75	2.50	IPL Systems Inc.	4.50	-1.50 -25.0
KMAG	37.50	21.38	Komag Inc	29.00	-4.19 12.5
MTSI	26.38	11.25	Micro Touch Systems Inc.	20.88	1.38 -0.5
PEAK	26.75	12.25	Peak Technology Group	25.38	0.38 -2.4
PMCI	19.75	6.75	Pinnacle Micro Inc	8.00	-1.00 -33.1
PTNX	75.50	0.13	Printronix Inc (H)	16.25	-1.75 -9.7
AQM	6.75	3.75	QMS Inc.	9.00	0.00 0.0
QNTM	20.38	15.00	Quantum Corp.	30.00	-8.50 26.9
RDUS	14.00	0.94	Radius Inc.	2.38	-0.63 30.6
SEG	67.25	36.63	Seagate Technology	67.50	-7.25 15.1
STK	44.13	21.25	Storage Technology (H)	67.75	7.00 18.1
ZTLC	8.75	3.25	Streamlogic Corp	5.31	-0.31 -8.6
TEK	61.88	29.75	Tektronix Inc.	30.38	1.13 -3.0
XIRC	54.75	36.50	Xircom Corp. (H)	52.50	1.88 -3.4
AMSY	33.38	15.13	American Mgmt. Systems	30.00	0.38 1.3
ANLY	43.75	21.50	Analysts Int'l.	41.25	1.25 -0.1
AUD	63.38	30.75	Auto Data Processing	57.38	-0.88 -2.1
CATP	82.63	22.00	Cambridge Tech. Partners	30.75	0.75 1.1
CEN	56.88	33.00	Centocor Corp	38.63	-2.50 -4.7
CIDC	28.63	10.88	Gandalf Inc.	26.88	-0.38 -1.4
CMRZ	54.00	9.75	Computer Horizons	44.75	-2.50 -5.3
CSC	80.75	51.25	Computer Sciences	75.50	-0.75 -1.0
TSK	39.50	30.75	Computer Task Group	50.38	1.13 4.1
CPU	48.75	17.00	CompUSA Inc.	30.25	-6.38 25.0
CDAT	27.50	8.63	Control Data Systems Inc.	23.13	-0.50 -2.1
EDGS	14.75	5.00	Edmead Discount Software	11.63	1.00 -7.0
GME	16.63	67.50	General Motors E (EDS) (H)	57.00	0.00 0.0
IMAC	24.25	9.13	Imacon Corp	19.00	1.38 -0.7
INEI	14.63	3.50	Intelligent Electronics	10.13	0.13 1.3
KEA	41.25	18.25	Keane Inc.	30.25	1.38 -1.6
MSEL	8.50	5.25	Merisel	6.19	0.06 -1.9
MICA	16.25	7.25	Micronode Int.	10.50	0.06 0.4
PAYX	50.63	29.38	Paychex (H)	49.50	-0.38 -0.8
PMS	55.50	42.63	Policy Management Sys. (H)	54.88	0.50 0.9
REY	53.38	38.13	Reynolds and Reynolds (H)	51.50	2.13 6.1
SCBI	30.50	15.75	SCB Computer Tech Inc.	16.25	2.50 13.0
SEIC	26.38	19.75	SEI Corp	21.88	0.06 1.7
SMED	72.13	36.38	Shared Medical Systems	54.50	-2.00 -1.5
SSPE	26.50	17.00	Software Spectrum Inc.	23.50	-1.00 -4.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

Copyright Nobody International Inc., Boulder, Colorado

This information is based on sources believed to be reliable, and while extensive efforts are made to ensure its accuracy, no guarantees can be made. Nobody International and Computerworld assume no liability for any inaccuracies. For information on Nobody's customized financial research services, call (303) 938-1877.

INTRODUCING THE FIRST HELP DESK WITH AUTOMATIC PROBLEM PREVENTION.



MORE THAN A REMEDY,* IT'S THE CURE.

New Vycor Enterprise not only knows every caller, it knows how to keep them from calling.

Now there's a way to solve help desk problems faster *and* reduce your calls dramatically. Introducing Vycor Enterprise with network management integration and problem prevention.



*As reported by former Remedy customers.

Vycor Enterprise is the first help desk solution that lets you manage, solve and even prevent problems across your entire enterprise.

It's unique problem prevention module lets you warn targeted users about network downtime, printer difficulties, software bugs and other problems before they are affected and call the help desk. You can also send out tips, new techniques and alternate solutions. In each case, messages reach only those users who need to know. With Vycor Enterprise, users have fewer problems and you get fewer calls.

Network management integration puts you in control.

Vycor Enterprise integrates with McAfee's Saber LAN Workstation network management tools. So now you can get inventory and desktop configuration data for faster problem resolution – plus software distribution and configuration management for complete independence.

All of which lets you work more effectively and with less frustration. As reported by the Meta Group, "Combining these tools...can increase first line problem resolution significantly...".



And solving user problems is easier. Simply click on One Button Problem Resolution™ or use the key word search. Both use expertise-based reasoning to provide the probable solution in a matter of seconds.

Vycor Enterprise with management integration and problem prevention. It's the first *complete* help desk solution. Call today at **1-800-332-9966** to find out more.

McAFEE

Network Security & Management

See Us At PC Expo, Booth #4862

[redacted] WWW. http://www.mcafee.com Internet FTP: ftp.mcafee.com BBS (408)988-4004 America Online: MCAFEE CompuServe: GO MCAFEE The Microsoft Network: MCAFEE

Telephone (408)988-3832 Fax (408)970-9727 © McAfee Associates, Inc., 1996 All rights reserved. All brands and products are trademarks of their respective holders.

How to contact CW editors

Contacting us by phone

All editors can be contacted at our main phone number, (508) 879-0700, unless otherwise noted below. Our 24-hour news tip line is (508) 820-8555. For subscriptions, call (800) 669-1002, back issues, call (508) 820-8129, reprints, call (508) 820-8123. Our main fax number is (508) 875-8931.

Contacting us by E-mail

Our Web address is www.computerworld.com. All of our staff members can be reached via E-mail on the Internet using the form firstname_lastname@cw.com. For example, News editor Patricia Keefe is at patricia_keefe@cw.com. IDG News Service correspondents can be reached using the form firstname_lastname@idg.com. Subscription inquiries go to circulation@cw.com. Letters to the editor are welcome and should be sent to letters@cw.com. Please include your address and telephone number.

Contacting us by mail

Our postal address is PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701

Respond to our Talkback inquiries at talkback@cw.com.

Contacting CW editors

We invite our readers to call or write with comments and ideas. It is best to submit ideas to one of the department editors as well as to the appropriate beat reporter.

Editor • Paul Gillin (508) 620-7714
Executive Editor Maryfran Johnson (508) 820-8179

Department Editors/News

News Editor	Patricia Keefe (508) 820-8183
Deadline Editor	Johnnie Ambrosio (508) 820-8555
Assistant News Editor	Gail Weinberg (508) 820-8177
Assistant Deadline Editor	Kevin Fogarty (508) 820-8146
Online Editor	Michael Fitzgerald (508) 820-8106
Associate Editor, News	Mitch Betts (202) 347-4718

Senior Editors/News

Government and security	Gary H. Anthes (202) 347-8134
Local-area networks	Laura Wilde (508) 820-8182
Network management	Patricia Keefe (617) 924-3485
PC hardware, systems management	Bob Francis (714) 362-1188
Application development	Frank Hayes (415) 243-3502
Development	Thomas Hoffman (201) 587-0090
Client/server applications	John Jung (610) 532-7397
Internet	Ellen S. Hoch (202) 347-5810
Apple and PC software	Lisa Picarille (415) 548-5571
Databases	Don Andersen (360) 379-2085
Unix, Sun, open systems	Craig Stedman (508) 820-8120
Internet	Alison Wagner (415) 548-5513
Telecommuting	Bob Wallace (508) 820-8214

Senior Writers/News

Mainframe computing, Ameritech	Mindy Blodgett (508) 820-8168
Mainframes, high-end storage	Michael Goldberg (508) 820-7783
Groupware, E-mail	Tim Greene (508) 820-8125
Midrange hardware, Internet, intranet	Julia Lawler Vizoso (508) 820-8230
PC software, utilities, imaging	April Jacobs (508) 820-8202
App development environments	Sharon Gaudin (508) 820-8122

Staff Writers/News

Wireless products, imaging, multimedia	Stewart Deck (508) 820-8235
Telecommunications	Ellen Ebsen (508) 820-8273
@Computerworld	Beth Gilbreath (415) 548-5528
@Computerworld	Juan Carlos Perez (508) 820-8247
@Computerworld	Randy Weston (508) 628-4869

Opinion/Viewpoint

Technical Editor	Charles Babcock (415) 548-5322
Viewpoint Editor	Mitch Betts (202) 347-4718

Department Editors/Features

Technology Evaluation/CW Labs	Robert Connolly (508) 820-8144

Senior Editors/Features

Managing	Allen E. Allen (508) 620-7714
In Depth	Steve Ulfelder (508) 820-7745
Planning & Forecasting	Tom Hoffman (508) 820-8147
Corporate Strategies	Joseph Maglitta (508) 820-8152
Management	Robert L. Scheier (508) 628-4731
Careers	David E. Weldon (508) 820-8166

Associate Editors/Features

CW Labs	Cathleen Gagne (508) 620-7739
Managing	Rich Sala (508) 820-8118

Research

Bob Fink, senior research manager (508) 820-8202; Kevin Dunlap, senior researcher; Laura Pratt, research analyst; Amy Mallory, assistant researcher; Stephanie McCann, senior graphics coordinator; Rod Scott, Peregrine intern.

Special Projects, Supplements & Publications

Leslie Goldman, Special Projects Editor; Carol Pinsonneault, Publishing Director; Sue Hilton, Custom Publishing Manager; Bruce Grayson, special projects editor (508) 820-8203; Kevin Cronkhite-Forward, Pat Seidman, Anne McCrory, managing editors.

Copy Desk

Ellen Pondrey, managing editor (508) 820-8175; Deborah Wood, assistant managing editor; Christine Alcaro Maguire, senior copy editor; Kimberly Gilford, Michelle Grabon, senior production copy editors; Jamie Eckler, Pat Hyde, David Hunsel, copy editors; Marion Sampinos, online copy editor.

Graphic Design

Tom Monathan, design director (508) 820-8158; Julie Czarnowski, Michael J. Hayes, Nancy Kowal, senior graphic designers; David Waugh, Mary Beth Walsh, Stephanie Worthley, graphic designers; Rich Tennant, John Shannon, cartoonists.

Administrative Support

Linda Gorgone, office manager (ext. 8178); Connie Brown (ext. 8178), Lorraine O'Neill (ext. 8179), Rita Jones (ext. 8177), editorial assistants; Chris Flanagan, West Coast editorial assistant, (415) 548-5563.

Computerworld Client/Server Journal

Alan Alper, editor (508) 820-8115; Mary Dunsford, executive editor; Catherine McCarthy, managing editor; Stephanie Faucher, art Director; Christopher A. Smith, assistant managing editor.

IDG News Service Correspondents

Paris bureau chief	Marc Ferranti (33 1) 4965-8600
Paris correspondent	Jennifer Mann (33 1) 4965-7387
Dutch correspondent	Thorsten Dams (49 89) 60-60-47
UK correspondent	Ian Condon (44 181) 410-0800
Tokyo correspondent	Bob Gish (81) 33-256-1202
Tokyo correspondent	Yoshio Ohnuma (81) 60-320-8323

Companies in this issue

Page number refers to page on which story begins. Company names can also be searched at www.computerworld.com.

3Com Corp 12,65
Abudawood for Industry 61
Ademco Corp. 47
Adobe Systems, Inc. 15
Advanced Logic Research, Inc. 93
Air Products & Chemicals, Inc. 10
America Online, Inc. 2,4,73,83
Amoco Co. 105
Andersen Consulting 107
Apian Software, Inc. 58
Apple Computer, Inc. 2,15,47
Arcade Software, Inc. 119
Armon Networks, Inc. 65
Army Air Force Exchange 29
Arthur Andersen & Co. 61
Ascend Communications, Inc. 68
AST Research, Inc. 14
Atria Software, Inc. 32
Au Bon Pain Co. 39
Avid Technology, Inc. 47
Avon Products, Inc. 32
Bain & Co. 88
Bank One Corp. 105
BankAmerica Corp 83
Banyan Systems, Inc. 8
Barnett Banks, Inc. 6
Bay Networks, Inc. 12,65
BBN Corp. 4
Bell Atlantic Nynex Mobile 8
Bell Sygma, Inc. ..... Cover
Beth Israel Hospital 82
Bethesda Naval Medical Center 73
Black Diamond Data Systems, Inc. 52
BMC Software, Inc. 8
BookMaker Corp. 58
Borland International, Inc. 8,52
Broadview Associates LLC 32
Brooktrout Technology, Inc. 58
BT 4
Cabletron Systems, Inc. 8,22,65
Candle Corp. 68
Capital Cities/ABC, Inc. 2
Centura Software Corp. 8
CFM, Inc. 56
Charles Schwab & Co. 125
Chen Systems, Inc. 96
Chevron Information Technology Co. 10,65
Cheyenne Software, Inc. 39,119
Chrysler Corp. Cover1
CIMI Corp. 4
Cisco Systems, Inc. 12,65
Claris Corp. 15
Client/Server Labs, Inc. 94
Clorox Co. 61
CNA Insurance Co. 39
Comdisco, Inc. 14
Commence Corp. 52
Commercial Federal Corp 84
CommVault Systems, Inc. 32
Compaq Computer Corp 39,93,96,132
Compression, Inc. 61
CompuServe, Inc. 2,73
Computer Associates International, Inc. 24
Computer Security Institute 73
Compuware Corp. 12
Concert 4
Corel Corp. 32
Countrywide Insurance Co. 122
Cray Research, Inc. 132
Creative Networks, Inc. 47
Cubix Corp. 71
Dahlin Securities Corp. 32
Dataquest 96
Dell Computer Corp. 14,39
Deloitte & Touche 82
Destiny Software Corp. 83
Detroit Edison Co. 14
Digital Equipment Corp. 8,12,34,39,47,96,132
Direct IPO Corp. 125
Donald B. Cook & Associates 132
Donaldson, Lufkin & Jenrette, Inc. 32
Du Pont Co. 39
Dunlop Tire Corp. 39
EMC Corp. Covers,132
Encore Media 2
Entergy Services, Inc. 65
EShop, Inc. 32
Federal Aviation Administration 73
Fourl1 Corp 29
Freightliner Corp. 81
Gateshcasms, Inc. 14
General Motors Corp. 39
Gerard Klauer Mattison & Co. 4
Gordon & Glickson 2
Harbourton Medical 15
Hatfield Quality Meats, Inc. 12
Hertz Computer Corp. 42
Hewlett-Packard Co. 8,10,32 39,47,61,65,68,82,93,96,132
Hitachi Data Systems Corp. Cover1
HNC Software, Inc. 29
Holland & Hart 6
IBM PC Co. 24
IBM ..... Cover1,2,6,8,13,14,29 ..... 32,39,42,52,58,65,68 93,96,102,132
Information Builders, Inc. 50
Information Systems Security Association 73
Informix Software, Inc. 76
Innovative Telecom Corp. 24
Insignia Solutions, Inc. 8
Insurance Services Office, Inc. Cover1
Integrated Data Systems 20
Intel Corp. 8,29,93,96,132
Internal Revenue Service Cover1,14
International Data Corp. 12,14 29,32,39,47,54,132
Internet Trade Line, Inc. 6
Ipswitch, Inc. 71
JCC Corp 14
KTVX 20
LAN Innovations, Inc. 71
Legato Systems, Inc. 39,119
Leo Burnett 88,107
Life Cycle Consulting, Inc. 52
Lightbridge, Inc. 54
Logical Data Solutions, Inc. 50
Logicraft Information Systems, Inc. 56
Lotus Development Corp. 6,8 14,20,32,47,50,52,56
Lucent Technologies, Inc. 32
Macromedia, Inc. 2
Magee-Women's Hospital 50
MasPar Computer Corp 29
MCI Communications Corp. 4,29
Merrill, Lynch & Co. 6
Micro Computer Systems, Inc. 71
Microsoft Corp. ..... Covers,2,6,8 ..... 14,15,20,32,39,47,50 56,61,65,73,76,81,93
Miller Brewing Co. 105
Mobil Corp 2
Morgan Stanley & Co. 73
Motorola, Inc. 81
NAC Reinsurance Corp. 47
NASA's Marshall Space Flight Center Cover1
National Journal, Inc. 2
National Semiconductor Corp. 8
NationsBanc Services, Inc. 39
NBase Communications, Inc. 8
NeoVista Solutions, Inc. 29
Netframe Systems, Inc. 96
NetManage, Inc. 8,52
Netpower, Inc. 96
Netscape Communications Corp. 2,6,14,32,61,76,83
Netsys Technologies, Inc. 32
Network Appliance, Inc. 82
Network General Corp. 32
Nortel, Inc. 42
Northwestern Mutual Life Insurance Co. 88
Novell, Inc. ..... 6,14,20,32, ... 47,56,71,96
Olivetti Personal Computers USA, Inc. 14
Ontario Hydro 8
Open Environment Corp. 8
Open Horizon, Inc. 52
Open Market Corp. 32
Oracle Corp. 4,8,14,20,47,76
PeopleSoft, Inc. 50
PerfectData Corp. 125
Perkin-Elmer Corp. 8
Philips Electronics North America Corp. 50
Pilot Software, Inc. 54
Platinum Technology, Inc. 29
PostModern Computing Technologies Inc. 61
Poulton Associates, Inc. 2
Powersoft Corp. 8
Price Waterhouse 105
Prodigy Services Co. 73
Products, Inc. 32
Prolific, Inc. 58
Pure Software, Inc. 32
RDI Computer Corp. 42
Reebok International Ltd. 73
Right! as, Inc. 56
San Andreas Systems 15
SAP AG Covers,2,50
Sasol Ltd. Cover1
SCO, Inc. 8
Seagate Enterprise Management Software, Inc. 30
Seagate Software, Inc. 119
Seagate Technology, Inc. 39
Secure Computing Corp. 71
Semaphore CommunicationsCorp. 68
Sharp Electronics Corp. 42
Sheridan Software Systems, Inc. 58
Sierra Research Corp. 132
Silicon Graphics, Inc. 47
Siemens S.R.I. 61
SNMP Research International, Inc. 10
SolCom Systems, Inc. 71
Sony Electronics, Inc. 82
Spiegel, Inc. 32,107
Spring Street Brewing Co. 125
Sprint Corp. 65
State Farm 88
Storage Technology Corp. Covers1,42,132
StrataCom, Inc. 65
Stratus Computer, Inc. 96
Sun Microsystems, Inc. 6,8,32 39,47,50,61
SunSoft, Inc. 65
Sybase, Inc. 4,32,58
Symantec Corp. 14
SystemSoft Corp. 8
Systron, Inc. 14
Tandem Computers, Inc. 83
Tech-Teach International, Inc. Cover1
Technology Partners 86
TeleChoice, Inc. 82
Tellabs, Inc. 84
Texas Instruments, Inc. 14,65
The Dun & Bradstreet Corp. 54
The Good Guys 32
The Washington Post Co. 2
Time Warner Entertainment Co. 8
Tivoli Systems, Inc. 39,65
Toshiba America Information Systems, Inc. 14
Tower Records and Video 32
Toys'R Us, Inc. 105
Tricord Systems, Inc. 96
U.S. Department of the Treasury ..... Covers
UAL Corp. 107
UB Networks 68
Unisys Corp. 8
United Air Lines 107
UUnet Technologies, Inc. 4
Verity, Inc. 4
Vermeer Technologies, Inc. 6
Videography 82
Vinca Corp. 14
Virtual Technologies 2
Webmaster's Guild, Inc. 4
WebMate Technologies, Inc. 76
Wells Fargo & Co. 83
Westinghouse Electric Corp. 39,105
Williams-Sonoma, Inc. 32
Wit Capital Corp. 125
Wojnar Productions, Inc. 47

Periodical postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publications agreement #1958497. Computerworld (ISSN 0010-4841) is published weekly except a single combined issue for the last week in December and the first week in January by Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. Copyright 1996 by Computerworld, Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed. Back issues, if available, may be purchased through the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.40 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $6.00 a year U.S. - $40 a year Canada - $100 a year Central & So. America - $150 (surface) a year; Europe - $295 a year; all other countries - $295 a year. Subscriptions call toll free (800) 669-1002. POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305.

It's time the Internet got down to business.

It's called

the intranet.

Let Microsoft® show you how. Join us at

www.microsoft.com/intranet/

Microsoft®

WHERE DO YOU WANT TO GO TODAY!™

© 1996 Microsoft is a registered trademark and *Where do you want to go today?* is a trademark of Microsoft Corporation.

Second crash brings down Mass. registry

By Michael Goldberg

In the past month, two of the ancients' elements — fire and ice — have crashed the computers at the Massachusetts Registry of Motor Vehicles.

A Storage Technology Corp. Iceberg disk array failure last month kept the registry off-line for 15 hours. The failure stalled lines of drivers waiting for licenses and prevented police from verifying motorists' registrations.

Last week, an overheated channel board in an EMC Corp. Symmetrix 5500 storage subsystem caused enough smoke in a data center in Chelsea, Mass., to activate a gas-spewing fire suppression system and shut down power in the building.

Pair of problems

The 180G-byte subsystem, owned by the state Office of Management Information Systems, is right next to the registry's mainframe. So when the power went out, the registry sustained its second unusually public system failure in five weeks.

"The irony of the situation is stunning," said David Lewis, deputy registrar of motor vehicles and the agency's IS chief. "We came down hard. It wasn't very graceful."

Power was out for seven hours, beginning at 8:30 a.m. As a result, the registry asked customers to return the next day, and the agency kept its 39 branch offices open late for them.

Smoking rare

Thomas B. Lahive, an analyst at International Data Corp. in Framingham, Mass., said it is unusual to hear about smoking circuitry in a storage subsystem. He said state officials may need to examine the new data center building for power surges and other problems.

No data was lost or corrupted in the crash, said Ralph Ragucci, data center director at the Massachusetts Information Technology Center. EMC technicians took a few hours to isolate the channel board and replace and test the storage system before the system was back up.

A StorageTek spokesman said no information was available yet from engineers who are examining the registry's failed Iceberg array, which was shipped back to Louisville, Colo., last month.

NT 4.0 crash warning issued

CONTINUED FROM COVER 1

tors and Microsoft executives.

Microsoft supports thousands of drivers, but there are almost as many small, third-party vendors that churn out video drivers they never bother to get tested and Microsoft-certified, said Mark Minasi, president of Tech-Teach International, Inc. a systems integrator in Arlington, Va.

Interviews last week with at least eight users of the NT 4.0 Beta 2 release indicate this version delivers performance boosts of 100% to 150% over NT 3.51 in downloading graphics files and running multimedia applications.

To achieve those gains and endow Windows NT with speed comparable to Windows 95, Microsoft moved the Windows NT user interface functions from the "User mode" to the "Kernel mode."

These two modes will let NT access hardware device drivers and memory addresses, which are necessary to perform any computing task.

NT also employs the User and Kernel modes to allocate memory as needed.

A Kernel mode program can access any memory in the system. By contrast, the User mode program can access only the memory that has been allocated by the Kernel mode.

"So if a User mode program like Microsoft Word blows up, it can only crash itself. But under the new NT 4.0 structure, things like video and printer drivers are now in Kernel mode," Minasi explained. "If they crash, they can potentially crash both the server and the workstation."

Microsoft made the change to speed up the core NT 4.0 operating system.

Hard lessons

One information systems manager at a large East Coast engineering firm, who requested anonymity, found out the hard way what the wrong video driver can do to NT.

The shop had been running the 4.0 beta in a pilot network for about 20 of its engineers when the server crashed.

"These were all power users [and] unbeknownst to me, somebody decided to install a cheap, no-name video driver so he could get snappy performance on the 32-bit games that come with NT Workstation," the manager said.

"We now have a standing, no-exceptions rule: Microsoft-approved hardware only," he emphasized.

For users such as J. Briscoe Stephens, the advanced scientific information systems coordinator at NASA's Marshall Space Flight Center in Huntsville, Ala., the benefits of the Beta 2 release outweigh potential problems.

"Moving the user interface functions into the underlying Windows NT operating system puts more responsibility on the user. People should be smart enough to not cut corners by buying untested devices [to] save a few dollars," Stephens said.

Advice from those who do Windows

Users and systems integrators offer the following advice to get the highest speed and reliability from Windows NT 4.0:

- Use only the video and printer drivers that are on Microsoft's approved hardware list.
- Keep your servers as clean as possible. That means installing name-brand adapters and drivers that come with a warranty.
- Whenever possible, use the standard VGA driver that comes bundled with Windows NT 4.0. Users and system integrators say it is one of the best debugged drivers in the industry.
- Always test the drivers on a pilot network — for at least one or two weeks and preferably for 30 days — before you buy any driver in volume.
- Limit and keep close track of how many 32-bit Windows 4.0 video games your users are playing.

Mostly stable

Users have been generally pleased with the power and stability of the Windows NT 4.0 Beta 2 release, but a few bugs have cropped up.

Jim Snively, a systems consultant at Sun Oil Co. Refining Marketing in Philadelphia, said he can't get the Dynamic Host Configuration Protocol (DHCP) to work.

DHCP lets businesses — such as a car rental agency — automatically assign TCP/IP addresses as needed. This is much quicker and more efficient than manually assigning permanent TCP/IP addresses.

Snively and other users recently posted messages regarding the glitch on Microsoft's CompuServe forums.

"They've told us they are now working to correct the problem, but we don't have a date yet," Snively said.

— Laura DiDio

In disk-array: IBM allies with StorageTek

CONTINUED FROM COVER 1

buys arrays from EMC Corp. and Hitachi Data Systems Corp.

But confusion may arise in the short term as IBM trains its sales force to sell what until now have been "enemy" products. IBM also needs to better explain how it will position and price the StorageTek arrays alongside Ramac, users said. StorageTek users, in particular, said they are concerned.

Setting positions

IBM last week said it will sell Ramac as a high-availability array for storing mission-critical data. It will pitch Iceberg as a less-expensive product, said Mike Harrison, director of storage marketing programs at IBM. Kodiak targets high-performance applications.

But Ramac and Iceberg overlap each other much more than IBM is letting on, said Dick Fernandez, assistant vice president of computing services at Insurance Services Office, Inc. Insurance Services is a clearinghouse for property and casualty insurance data in Pearl River, N.Y., that has 450G bytes of Iceberg storage.

"I want to get past the hype and get to the real-world stuff," said Fernandez, who plans to meet with IBM officials later this month. He said he "may want to insist that [he] stay with StorageTek" for maintenance, even on Iceberg purchases that come from IBM.

Mainframe storage

Other StorageTek customers also voiced concern about service and support plans and whether IBM will honor pricing deals that StorageTek verbally agreed to for future purchases and upgrades.

As part of the deal, IBM will fund StorageTek's future development of Iceberg and Kodiak, which are being renamed as Ramac products.

IBM's development of a final Ramac upgrade, which is due in the first quarter next year, will also continue, as will its next-generation Seastar project, Harrison said.

James Vanderslice, general manager of IBM's storage division in San Jose, Calif., acknowledged that its current one-size-fits-all Ramac strategy wasn't good enough for many customers.

Ramac is too pricey for some users and doesn't pack the performance offered by other arrays, such as Kodiak, he conceded.

Ramac has also been hurt by its reliance on IBM's aging 3990 Model 6 disk controller.

The stand-alone 3990, a full-size box in its own right, can manage only 180G bytes of data, far less than the newer controllers that rivals integrate into their arrays.

Having to use up to four 3990s to manage the same amount of storage that EMC can handle with a single controller makes it "very difficult for Ramac to compete," Bell Sygma's Perry said.

Choppy waters

Meanwhile, Seastar has slipped from the original target date of mid-1996 to late 1997 or even 1998 for a version that supports big iron.

"If the Seastar stuff were right around the corner, I don't think IBM would be doing this. But they need to keep their customers," said Luther Perry, information services director for the County of Santa Cruz in California.

Seastar will connect multiple disk and tape controllers in a fault-tolerant ring that can support mainframes and other servers. The all-new architecture has been IBM's hope for stealing technical leadership back from EMC and other vendors, although analysts said the long delay makes that a tougher task.

Software lags hardware's fourfold leap

Charles Babcock

Hardware is about to get four times faster, but PC software isn't keeping up. As Intel groups four Pentium Pro microprocessors on systems boards, the applications to run on them lag behind. Far behind.

PC software makers are still thinking serially, while hardware is about to enter the parallel age. A flock of Intel's multiprocessor machines is about to come off the production lines.

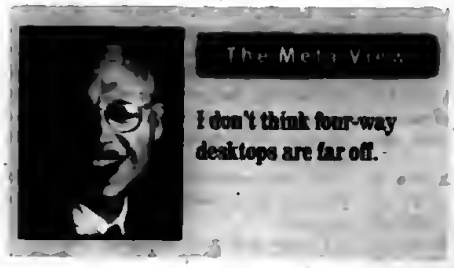
Why not a parallel Word or QuattroPro that takes advantage of four-way processing capability? Or a parallel data analysis system for the data warehouse? Database management systems effectively exploit parallel hardware.

Many would say parallel PC software isn't necessary yet. Compaq, IBM, Digital and Hewlett-Packard are producing Pentium Pro servers, not desktops. But I don't think four-way desktops are far off. The financial services industry deals with multiple data streams and time-sensitive decision-making. What appears to be a $20,000 server to the rest of us seems like a great candidate for a desktop to Wall Street.

How could your PC software tap in to this four-way power? In one sense, PCs that run Windows NT and OS/2 could run more tasks — four applications could run at the same time — with these symmetrical multiprocessing operating systems. But even NT and OS/2 can't get an application to work faster, no matter how much hardware is thrown at them. PC software is single-minded. It runs on a single CPU no matter what, and PC software makers are too busy bulking up on features to recognize the dawn of a parallel age.

Although the major PC software tools ignore the trend toward parallelism, one small company has addressed the field.

The Portland Group in Wilsonville, Ore., supplies High-Performance Fortran, which is used in parallel on Cray Research supercomputers. It also offers C and C++ parallel compilers on the Intel x86 series. But Doug Miles, director of marketing at The Portland Group, says the firm doesn't market them because no one is interested. The Portland Group offers profiler tools that can analyze how to parallelize a program, browsers and debuggers for parallel systems and compilers.



A very low percentage of The Portland Group's business is with PC software makers, Miles says, but "with the Pentium Pro, that's going to change. These [Intel] boards give us the opportunity to push high-end, parallel technology down to the desktop," he says. But you don't see Borland, IBM or Microsoft racing to beat the competition, do you?

What remains a long way off is a body of programming talent that can put parallel concepts in desktop software. Most programmers aren't prepared to think in parallel terms. They are taught math and programming in serial terms. They learn to attack logical problems through a sequence of steps.

Parallel thinking requires subdividing a problem into sections whose tasks can be attacked by a set of CPUs all at once.

Some people think parallel compilers eventually will automatically rearrange software for us, but I think they'll have little impact. They optimize the parts of programs that are most obviously parallelized. But they don't work magic. Given a long series of serial tasks, the parallel compiler won't help much.

Instead, human intelligence must reorganize the problem to maximize the use of multiple processors. But getting today's programmer to think in parallel terms is "mind-bogglingly hard to do," says Chris Willard, a high-performance computing analyst at International Data Corp. in Framingham, Mass., and a former parallel programmer at the NASA Ames Research Center in Mountain View, Calif.

Parallel programs were developed by astrophysicists, organic chemists and molecular biologists, whose research depended on them. Few commercial firms knew how to generate parallel systems, and fewer were interested in doing so for small markets.

That will change. Intel's four-way systems board has become a readily available component. There was no mass market for parallel programs before, but low-cost, four-way hardware will change that.

Initially, we may have to rely on smaller firms to supply the parallel market. But the day isn't far off before the mainstream companies will have to confront the need for parallel or stand by as today's unknowns give rise to a new generation of software giants.

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

Inside Lines

This is your brain on Windows

The never-ending Internet newsgroup debate about whether PCs or Macintoshes rule has been bringing a legitimate online support group for victims of brainwashing and torture to its knees with message after message on weighty topics such as "Why Windows 95 doesn't suck." Microsoft haters apparently decided that alt.mindcontrol would be a receptive site for warnings about the "evil empire" in Redmond, Wash. But an alt.mindcontrol regular last week sent out a plea that the message flow be stopped, saying the PC/Mac war accounted for 90% of the newsgroup's postings. That was making alt.mindcontrol "almost useless," he added.

'net start-up lures Silicon Valley suits

Executives at perfectly stable computer companies continue to leave in droves for promising baby Internet start-ups. Come July 1, one such young'un, Active Technologies, will introduce itself and the former Sun and Adobe suits who founded it, according to a source close to the Mountain View, Calif., firm. Active will offer software to tie World Wide Web applications in to relational databases. The product reportedly will reflect its founders' roots: It's written in Java.

'I'll be baaack . . . with another name'

Warner Bros. studios last week got out an eraser for its upcoming Arnold Schwarzenegger summer flick, also called *Eraser*. Chip maker Cyrix filed suit because the villainous corporation in the film was named Cyrex. Warner Bros. is in the process of changing the name, which appears on a number of hats, shirts and buildings in the film.

IBM frames FRAD

IBM soon will begin shipping a product called a frame-relay access device (FRAD), which will enable users to save on wide-area costs by squeezing many types of data over frame-relay links. The 2218 Nways Model 12X was designed to provide an entry-level device for tying far-flung branch offices to corporate data centers. The FRAD will ship on June 28 at just under $2,000.

The 5th Wave by Rich Tennant



Making out on the Internet

Make Systems in Mountain View, Calif., is preparing to upgrade its performance evaluation and simulation tools for wide-area networks in two weeks. Version 2.5 of NetMaker XA will map traffic to and from the Internet to help administrators fully baseline WAN activity.

Westell deals first modem card for ADSL

Westell Technologies will likely become the first vendor to ship a PC modem card that will enable users to take advantage of Asymmetric Digital Subscriber Line (ADSL) technology. ADSL transmits data at 1.544M bit/sec. over regular telephone lines. The Oswego, Ill., firm will ship the $500 FlexCap PC card modem for ISA-bus PCs by summer's end.

DEC to ship 500-MHz chip

Digital will release a 500-MHz version of its EV56 21164 Alpha chip. Expected the week of July 1, the chip will incorporate new visual instructions into the existing architecture and will be aimed mainly at corporate multimedia and videoconferencing markets.

Les Alberthal, chairman and CEO of Electronic Data Systems, last week launched EDS' first day of independence from General Motors by ringing the opening trade bell at the New York Stock Exchange. But he wasn't sporting one of the T-shirts that he had passed out to celebrants at EDS headquarters the previous Friday, when GM shareholders approved the spin-off. Those shirts stated, "Split Happens." Whatever happens, you can contact Computerworld *with your news tips or happenings. You can reach news editor Patricia Keefe at patricia_keefe@cw.com or (508) 820-8183.*



Presenting the IBM PC Server 320 Internet Series Solution.
It doesn't get much easier than this.

Call 1 800 426-7255, ext. 4116.* Or visit us at www.pc.ibm.com/servers/.

IBM.

Solutions for a small planet™

*M–F, 8 am–8 pm EST. In Canada, call 1 800 465-3299 (ask for document 04S800). The following are trademarks or registered trademarks of International Business Machines Corporation: IBM, Solutions for a small planet, OS/2 and NetFinity. THE 10 is a trademark of Think Systems. Microsoft, Windows and Windows NT are trademarks or registered trademarks of Microsoft Corporation. Other company, product or service names may be trademarks or service marks of others. © 1996 IBM Corp. All rights reserved.



Compiled code, native database drivers and 32-bit architecture. Let them shift your applications

There is nn faster client/server applicatinn development tool than the new PowerBuilder® 5.0.

And now, thanks tn cnmpiled code, optimized native database drivers and full 32-hit architecture, ynu can create fully scalable, business-critical applicatinns that meet even the most demanding performance requirements.



Check us out at http://www.powersoft.com and you may win free products or other great prizes.

Of course, there's more to PowerBuilder 5.0 than sheer speed. Ynu can nnw build distributed multi-tier applicatinns that nnt nnly access data anywhere, but deplny on any platform as well. And with new Internet features nn the way, you'll be able tn huild Weh browser "plug-ins" and Weh server applicatinns.

PowerBuilder 5.0 comes in three editinns; Desktnp, Prnfessinnal and Enterprise. Tn see this remarkable technology at a seminar, nr to get mnre infnrmation, call us at 1-800-395-3525. And kick your applications into overdrive.

Powersoft.